UNDERGRADUATE *Catalog*

2000-2002

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University of New Haven

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Vice President for Student Affairs
Student Center
932-7199

Call toll free 1-800-DIAL-UNH and ask for the four-digit extension required, or contact us on the web at: << www.newhaven.edu>>

University of New Haven

UNDERGRADUATE CATALOG 2000–2002

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Health Services Fax: (203) 931-6090

Website: www.newhaven.edu

This catalog supersedes all previous bulletins, catalogs and brochures published by the University of New Haven and describes academic programs to be offered beginning in fall 2000. Undergraduate students admitted to the university for the fall of 2000 and thereafter are bound by the regulations published in this catalog. Those admitted prior to fall of 2000 are bound by those new regulations which have been duly instituted and announced prior to the semester during which they are effective.

The University of New Haven is committed to affirmative action and to a policy which provides for equal opportunity in employment, advancement, admission, educational opportunity and administration of financial aid to all persons on the basis of individual merit. This policy is administered without regard to race, color, national origin, age, sex, religion, sexual orientation or disabilities not related to performance. It is the policy of the University of New Haven not to discriminate on the basis of sex in its admission, educational programs, activities or employment policies as required by Title IX of the 1972 Educational Amendments. This school is authorized under federal law to enroll nonimmigrant alien students.

Inquiries regarding nondiscrimination, affirmative action, equal opportunity and Title IX may be directed to the university's affirmative action officer at 300 Orange Avenue, West Haven, CT 06516; phone (203)932-7265. Persons who have special needs requiring accommodation should notify the Director of Disability Services and Resources at 300 Orange Avenue, West Haven, CT 06516 or by Voice/TDD at (203)932-7331.

Every effort has been made to ensure that the information contained in this publication is accurate and current as of the date of publication; however, the university cannot be held responsible for typographical errors or omissions that may have occurred.

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The university reserves the right, at any time, to make whatever changes may be deemed necessary in admission requirements, fees, charges, tuition, policies, regulations and academic programs prior to the start of any class, term, semester, trimester or session. All such changes are effective at such times as the proper authorities determine and may apply not only to prospective students but also to those who already are enrolled in the university.

Dear Student:

This catalog is the formal document through which we at the University of New Haven present our undergraduate academic programs to you. A quick perusal of its various sections will introduce you to the breadth and diversity of our educational offerings. A more in-depth examination will, we believe, help you choose–or confirm your selection of–the field or fields of study you wish to pursue at the university.

At UNH, you will find a challenging educational environment where you may experience the excitement of academic discovery and exploration. You will also find a friendly, caring atmosphere where students are our primary concern.

Our classrooms, laboratories and facilities are carefully designed and maintained to enhance the academic environment on campus. A wide range of services and numerous social, cultural and athletic activities are available to you as are internships, cooperative education opportunities and financial aid.

Our faculty care about you. Accomplished scholars with excellent academic credentials, they are dedicated to your success in the classroom. At UNH, qualified faculty teach all our classes; none are taught by teaching assistants. Our faculty work closely with students outside the classroom as well. They serve as mentors and partners in the pursuit of truth; they participate fully in our extensive advising process, including the university's special Freshman Advising Program; and they coordinate with our Center for Learning Resources, which offers a variety of academic support services. They develop warm, friendly relationships with their students, many of whom maintain these contacts long after graduation.

In short, the University of New Haven and all its programs are focused on you, our students. Our goal, as reflected in this catalog, is to provide the broad range of educational opportunities and the quality academic and professional preparation you will need to continue learning throughout your life and to embark on a meaningful and productive career in the global society of the 21st century.

Welcome to UNH, and good luck in your educational endeavors here.

Sincerely,

Lawrence J. DeNardis
President

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THE UNIVERSITY

THE MISSION of the University of New Haven is to develop career-ready and cultivated graduates, well prepared for meaningful roles and the pursuit of life-long learning in a global economy and society.

THE VALUES

- Belief in and practice of UNH's Mission and Vision.
- Commitment to the success of our students through caring and responsive service.
- Teamwork: help each other succeed and seek help.
- Open communications: be trusting, open, honest and straightforward.
- Commitment to thoughtful action.
- Think, articulate, do and evaluate.
- Lead by example with continuous improvement.
- Face all issues, no surprises, and be accountable.
- Respect for the individual, including his or her thoughtful input.
- Recognize success.

THE VISION is to be the institution of choice for students who seek the highest quality education for professionally oriented careers. We will be noted for our ability to combine professional education with liberal ats and sciences and the development of high ethical and cultural standards among our graduates.

The University of New Haven is a private, independent, comprehensive university located in southern Connecticut at the gateway to New England. The focus of the university is to prepare both traditional and returning students for successful careers and productive, self-reliant and ethical service to local and global society. The hallmark of a UNH education is quality educational opportunities at all post-secondary levels, through career-oriented academic programs with a strong liberal arts foundation, taught by a caring and highly qualified faculty in safe, convenient and diverse campus environments.

A solid core curriculum of liberal, humanistic coursework is balanced with professional programs in business, engineering, computer science and other advanced technical areas.

Moreover, the university is flexible enough to meet the needs of students who work while they attend UNH. A range of programs for part-time study are offered at night. A cooperative education program makes it possible for students to alternate semesters of class attendance with related work experience.

The Graduate School offers students the opportunity to continue study beyond the bachelor's degree on a part-time or full-time basis.

By responding to the educational needs of our students, the University of New Haven has become a major regional university serving both our students and the business community.

Accreditation

The University of New Haven is a coeducational, nonsectarian, independent institution of higher learning chartered by the General Assembly of the State of Connecticut.

The University of New Haven is accredited by the New England Association of Schools and Colleges, Inc., a nongovernmental, nationally recognized organization whose affiliated institutions include elementary schools through collegiate insturions offering post-graduate instruction.

Accreditation of an institution by the New England Association indicates that it meets or exceeds criteria for the assessment of institutional quality periodically applied through a peer group review process. An accredited school or college is one

which has available the necessary resources to achieve its stated mission through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future. Institutional integrity is also addressed through accreditation.

Accreditation by the New England Association is not partial but applies to the institution as a whole. As such, it is not a guarantee of the quality of every course or program offered, or the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution.

The university's School of Business has been admitted to candidacy status for accreditation by the American Assembly of Collegiate Schools of Business. Candidacy status is an indication that an institution has voluntarily committed to participate in a systematic program of quality enhancement and continuous improvement that makes AACSB accreditation a more realistic and operational objective. Candidacy is not accreditation and does not guarantee eventual accreditation.

The university is a member of the Accreditation Board for Engineering and Technology (ABET) and the university's bachelor of science degree programs in chemical, civil, electrical, industrial and mechanical engineering are accredited by its Engineering Accreditation Commission (EAC/ABET). The bachelor's degree program in computer science has had a successful initial review, and it is anticipated that official notification of accreditation will be received by September 2000 from the Computer Science Accreditation Board (CSAB).

The university holds membership in the Academy of Criminal Justice Sciences, the Accreditation Board for Engineering and Technology, the American Council on Education, the Association of American Colleges, the National Association of Independent Colleges and Universities, the National Association of Schools of Public Affairs and Administration (NASPAA), the National Association of Boards of Examiners for Nursing Home Administration, the College Entrance Examination Board, the Council of Graduate Schools, the Northeastern Association of Graduate Schools and is a member of other regional and national professional organizations.

Individual programs, departments and schools hold various forms of national, professional accreditations which are listed under relevant sections of the catalog.

History

The University of New Haven was founded in 1920 as the New Haven YMCA Junior College, a division of Northeastern University. The college became New Haven College in 1926 by an act of the Connecticut General Assembly. For nearly 40 years, the college held classes in space rented from Yale University.

In September 1958, the college completed construction of a classroom building on Cold Spring Street, New Haven, for its daytime engineering programs. That same year, the college received authorization from the Connecticut legislature to offer the bachelor of science degree in the fields of business accounting, management and industrial engineering.

Although the student body on the new Cold Spring Street campus numbered fewer than 200 persons, the college's facilities were fast becoming overcrowded. To meet the needs of the college and the local community, the Board of Governors purchased, in 1960, three buildings and 25 acres of land in West Haven, formerly belonging to the New Haven County Orphanage.

The combination of increased classroom space and the four-year degree programs sparked a period of tremendous growth in enrollment and facilities. In 1961, the year after the college moved to West Haven, the graduating class numbered 75. Thirty-seven years later the figure has climbed to 1,100 graduates annually.

New Haven College received full accreditation for its baccalaureate programs from the New England Association of Schools and Colleges in 1966. In 1969, the college took a major step forward with the addition of the Graduate School. Initially offering programs in business administration and industrial engineering, the Graduate School expanded rapidly. Today, a doctoral program and 30 master's programs, along with a wide variety of graduate certificates, offer the approximately 2,500 graduate

students many choices for post-baccalaureate study.

On the fifrieth anniversary of the founding of the college, in 1970, New Haven College became the University of New Haven, reflecting the increased scope and the diversity of academic programs offered. Today, the university offers more than 80 undergraduate and 30 graduate degree programs in six schools: the College of Arts and Sciences; the School of Business; the School of Engineering and Applied Science; the School of Hospitality and Tourism; the School of Public Safety and Professional Studies; and the Graduate School.

Undergraduate and graduate courses and programs are offered on the main campus in West Haven as well as in New London and at other off-campus and in-plant sites. A select group of undergraduate and graduate programs are offered on a cohort basis in Israel. Bachelor of science programs in fire science are offered at two off-campus locations in California. Graduate courses in selected fields are offered in New London, Stamford and Newington. The graduate forensic science, fire science and human nutrition programs are offered at satellite locations in California.

Philosophy

The University of New Haven, a private, comprehensive, multi-campus university based in southern New England, provides quality educational opportunities and preparation for self-reliant, productive, ethical service in a global society

Since 1920 when the school was founded, the University of New Haven has been an innovator in providing quality educational opportunities with special emphasis on programs addressing current and emerging needs in society.

Building on its successful past, the university will strive to achieve prominent and distinctive leadership as an institution that empowers students with substantive knowledge, ability to communicate, problem-solving skills and the practical experience appropriate for success as leaders in their professions and as citizens of the local and world communities.

The university is committed to participatory governance and quality management through continuous improvement to achieve its goals and perform its primary service—successful student and faculty growth and learning.

The basic objectives that guide and govern the academic programs and overall life of the university are:

- to recognize the educational interests of students geared toward specific professions and careers and prepare students for graduare and professional training beyond the baccalaureate,
- to provide undergraduate students with a liberal and humanistic education to help them acquire an understanding of society and their cultural heritage,
- to develop in all students a critical mind in the sense of a capacity to test and challenge previous assumptions and new ideas,
- to provide all students with a breadth of knowledge and a sensitivity to weigh ethical and moral issues and form values and life goals,
- to create for all students an environment which nurtures students' creative abilities and their intellectual curiosity through opportunities for independent study and investigation,
- to allow all students in a complex and technological society to pursue professional training which will assist them in pursuing rewarding and productive careers and adjusting to changing labor market conditions,
- to provide strong programs in student services, intercollegiate athletics and intramurals which address students' psychological, social, cultural and physical needs through a variety of individual and group activities directed toward the development of well-rounded graduates,
- to provide all students with opportunities to participate in work and service activities which allow them to use skills and exercise judgment and responsibility in a variety of settings outside the university community,
- to provide to the broad community, and to the state and nation, a flexible response system capable of meeting new and expanding educational needs in industry, service organizations, government and nonprofit institutions, and to promote research and scholarship among the faculty and doctoral students as a means of supporting the teaching commitments of the institution.

Schools of the University

College of Arts and Sciences

The College of Arts and Sciences offers associate degree programs in five academic fields and bachelor's degrees in more than 20 fields from art to psychology. School certificates offer specialized instruction to students interested in a concentrated exposure to one subject area, in fields such as journalism, paralegal studies and graphic design.

Through the Graduate School, the College of Arts and Sciences also offers master's degree programs as well as graduate-level certificates. Detailed information on the graduate programs is available in the Graduate School catalog.

School of Business

The School of Business offers programs in the fields of business administration, accounting, communication, marketing, business economics, finance, international business and sports management.

Through the Graduate School, the School of Business offers the M.B.A. and several master's degree programs as well as a number of business-related graduate certificates.

School of Engineering and Applied Science

The School of Engineering and Applied Science offers degree programs in nine fields: chemistry, chemical engineering, civil engineering, computer engineering, computer science, electrical engineering, general engineering, industrial engineering and mechanical engineering.

Master of science degree programs and graduate certificates are offered through the Graduate School in several engineering fields. Students should consult the Graduate School catalog for more details.

School of Hospitality and Tourism

The School of Hospitality and Tourism offers degree programs in dietetics, hotel and restaurant management, and tourism administration. The school's certificates offer concentrated study in the hospitality field.

A master of science degree in executive tourism and hospitality management is offered through the Graduate School. Students should contact the Graduate School for more details.

School of Public Safety and Professional Studies

The School of Public Safety and Professional Studies provides educational services for students who wish to major in degree programs specifically oriented toward career paths in aviation, occupational safety and health, criminal justice, forensic science, fire science, arson investigation, fire protection engineering, paralegal studies and related programs. The school provides a broad professional education which often incorporates classroom learning with laboratory and field experience. The school attracts students of varied ages and levels of experience, from recent high school graduates to seasoned industry professionals. It also serves professionals seeking programs designed to meet requirements of national and/or regional accreditations and licensures.

Graduate degree programs and certificates are available in various disciplines through the Graduate School.

UNH–Southeastern Connecticut

UNH–Southeastern offers undergraduate degree programs and certificates as well as graduate courses geared to the needs and interests of students in the New London area. Engineering, business, general studies and computer science courses are available mostly on an evening basis to the general public as well as to employees of certain corporations. For further information, please contact UNH–Southeastern Connecticut, 469 Pequot Avenue, New London, CT 06320 or phone (860) 701-5454, or 1-800-DIAL-UNH/ext. 7387.

Graduate School

The Graduate School, founded in 1969, offers 30 master's programs and a variety of graduate certificates. All academic programs are offered at the main campus in West Haven. Courses leading to the master's degree in business administration, education and other selected subjects are also offered at off-campus locations in New London, Newington and Stamford.

Programs offered by the Graduate School are:

Accounting
Aviation Science
Business Administration (M.B.A.)
Business Administration/Industrial Engineering (dual degree)
Business Administration/Public Administration (dual degree)
Cellular and Molecular Biology
Community Psychology
Computer and Information Science
Criminal Justice
Education
Electrical Engineering
Environmental Engineering
Environmental Science
Executive M.B.A.
Executive Engineering Management
Executive Tourism and Hospitality Management
Finance and Financial Services
Fire Science
Forensic Science
Health Care Administration
Human Nutrition
Industrial Engineering
Industrial Hygiene
Industrial/Organizational Psychology
Industrial Relations
Mechanical Engineering
Occupational Safety and Health Management
Operations Research
Public Administration
Taxation

Graduate certificates are also offered through the Graduate School.

The Graduate School operates on a trimester calendar, with terms beginning in September, January and April. Classes meet once each week during the regular trimesters. In addition, an abbreviated summer session is offered during July and August. Classes meet twice each week during this special summer session.

To accommodate working professionals, most courses meet in the evenings, beginning at 5:30 or 6 p.m. A few classes are scheduled earlier in the day or on weekends. Students may enroll either full- or part-time.

Additional information regarding graduate programs may be obtained from the Graduate School Admissions Office, by e-mail from gradinfo@charger.newhaven.edu, or by calling (203) 932-7133 or 1-800-DIAL-UNH, ext. 7133.

Degrees Offered by the University

The University of New Haven offers undergraduate programs leading to the bachelor of arts degree, the bachelor of science degree, and the associate in science degree. A number of undergraduate certificates are also available.

Bachelor's Degrees

The bachelor's degree programs at the University of New Haven generally require 120 or more credit hours of study and take a minimum of four years for full-time students. Part-time students take advantage of the full range of courses offered in the evening and complete their undergraduate degrees on a schedule that complements their careers.

Associate's Degrees

Associate degree programs are designed to encourage students to begin their college education even though they do not yet want to commit themselves to a full, four-year course of study. A minimum of 60 credit hours is required for the associate's degree, and the credits earned usually apply toward relevant bachelor's degree programs.

Certificates

Students can take their first step toward an undergraduate degree by registering for one of the certificates offered by the university.

Each certificate is carefully designed as a concentrated introduction to a particular subject area and consists of courses totaling 15 or more credit hours.

Later, students may choose to apply the credits they have earned toward a relevant undergraduate degree at the university.

Please contact the director of part-time admissions or the appropriate academic department for further details.

Graduate Degrees

Through the UNH Graduate School, programs are offered leading to the master of arts degree, the master of science degree, the master of public administration, the master of business administration, the master of business administration (executive program) and a number of graduate certificate curricula. For more information, contact the Graduate School Admissions Office or consult the Graduate School catalog.

University Policies

Diversity Policy

The University of New Haven is committed to achieving a diverse and pluralistic community which reflects the multi-racial and culturally diverse society in contemporary America.

The Diversity Committee has been established to guide the university in implementing this diversity policy. The university will work toward attracting and retaining a diverse faculty, staff and student body for the purpose of creating a pluralistic scholarly community. The committee will assist the administration in the development and implementation of programs and policies that support an enriched educational experience for a diverse university community.

The University of New Haven does not discriminate in admissions, educational programs, or employment against any individual on the basis of that individual's sex, race, color, religion, age, disability, sexual orientation, or national or ethnic origin.

Notification of the Family Educational Rights and Privacy Act (FERPA)

The Family Education Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records, as follows:

(1) **The right to inspect and review the student's education records within 45 days of the day the University receives a request for access.** Students should submit to the registrar, dean, head of academic department or other appropriate official written requests that identify the record(s) they wish to inspect. The university official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the university official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

(2) **The right to request the amendment of the student's education records that the student believes are inaccurate or misleading.** Students may ask the university to amend a record that they believe is inaccurate or misleading. They should write the university official responsible for the record, clearly identify the part of the record they want changed and specify why it is inaccurate or misleading. If the university decides not to amend the record as requested by the student, the university will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding hearing procedures will be provided to the student when notified of the right to a hearing.

(3) **The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent.** One exception which permits disclosure without consent is a disclosure to school officials with legitimate educational interests. A school official is a per-

son employed by the university in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the university has contracted (such as an attorney, auditor or collection agent); a person serving on the Board of Governors; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

(4) **The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University of New Haven to comply with the requirements of FERPA.** The name and address of the office that administers FERPA are: Family Policy Compliance Office, U.S. Department of Education, 600 Independence Avenue SW, Washington, DC 20202-4605.

The Student Right-to-Know and Campus Security Act

In accordance with Connecticut's Public Act 90-259 concerning campus safety and the 1990 federal law, PL101-542: The Student Right-to-Know and Campus Security Act, all colleges and universities receiving state and federal financial assistance are required to maintain specific information related to campus crime statistics and security measures, annually provide such information to all current students and employees, and make the data available to all prospective students and their families and to prospective employees upon request.

The university has worked hard to ensure that its students enjoy their years at UNH in a safe, secure environment. We are proud of our record in this regard. During 1998, the most recent calendar year for which statistics were available at this printing, rates of occurrence ranged from .0000 (in 7 of the reportable categories including homicide, rape, robbery and aggravated assault) to .0070 in larceny/theft, .0004 in burglary and .0007 in auto theft.

At UNH, the required information is compiled by the University Police Department and is published annually.

Drug-Free and Smoke-Free Environment

In accordance with federal law concerning a drug-free campus environment, the relevant university policy and regulations are provided to all current students and employees. The information is also available upon request.

The No Smoking policy is in effect in any campus administrative, academic or recreational building. This restriction applies to all UNH offices, classrooms, hallways, stairwells, restrooms, dining facilities, conference/meeting facilities, athletic facilities, and any other public spaces within these buildings. Smoking is confined to outdoor space, with ashtrays provided at entrances to each building.

Smoking in the residence halls is restricted to rooms, suites and apartments which have been designated as allowing smoking as agreed upon by the roommates. Smoking is not allowed in lobbies, hallways, laundry rooms, meeting rooms, community rooms or any other public spaces within the residence halls.

UNIVERSITY CURRICULA

University Core Curriculum

The University of New Haven is a microcosm of American society: atomistic, necessarily specialized and unavoidably complex. Nevertheless, it is the belief of the university that all students matriculating for associate's or bachelor's degrees should develop a common set of skills; furthermore, they should be exposed to a commonality of intellectual experiences which are the distinguishing traits of a university graduate. The purpose of the University Core Curriculum is to prepare all graduates for the changing, complex lives they will lead, to focus on the quality of their lives, and to enhance and expand the development of the wisdom by which they will frame their lives.

The University Core Curriculum, in seeking to accomplish the above specific ends, is dynamic. The core offers students the broadest possible perspective in their disciplines. For that reason, the University Core Curriculum includes new interdisciplinary courses as well as existing disciplinary courses. The interrelationship of these courses enables students to develop skills and conceptual abilities:

- Communication Skills
- Clear Reasoning:
  - Scientific methodology
  - Quantitative skills
  - Problem-solving and synthetic reasoning
- Dimensions of Our World, including the following aspects:
  - Social and cultural
  - Natural and physical
  - Technical
  - Historical
  - Ethical and moral
  - Aesthetic
- Courses will be chosen from the following categories:
  - Laboratory science
  - Social sciences
  - History
  - Literature or philosophy
  - Art, music or theatre

Bachelor's Degree Core Requirements

The University Core Curriculum for bachelor's degree programs encompasses a minimum of 11 courses, totaling 34 credits. Individual schools or departments may require additional core curriculum courses for their students. Some of the objectives outlined above are incorporated into more than one of the following areas.

Communication Skills . . . . . 6 credits

The intent of this area is to develop student skills in reading, writing and communicating in the English language. Two courses are required and should be taken in the freshman year:

E 105 Composition (or E 106 for international students)

E 110 Composition and Literature (or E 111 for international students)

If a student places out of E 105, then CO 100 Human Communication or a technical writing course (E 220 or E 225) must be taken.

Clear Reasoning . . . . . 9 credits

Quantitative Skills (3 credits)

All students must be able to think abstractly, to solve problems and to possess a basic ability to do numerical computations and elementary algebra.

Choose from the following:

M 109 Intermediate Algebra, *or*
M 127 Finite Mathematics, *or*

demonstration of an equivalent level of skill. Students may satisfy this requirement by satisfactory performance on a placement test administered by the Mathematics Department.

Computers (3 credits minimum)

Students should be able to use a computer to meet their needs. They should be able to operate the machinery, bring a program into execution, and use that program to accomplish some useful end.

Students may select **one of the following options:**

Option A—one course:

CS 107 Introduction to Data Processing

Option B—one of the following two-course sequences:

I

CS 110 Introduction to C Programming I
CS 111 Introduction to C Programming II (for non-CS majors)

II

CS 110 Introduction to C Programming I
CS 112 Introduction to C Programming II

III

ES 108 Engineering Workshop
CS 110 Introduction to C Programming I

Option C—one of the following three-course sequences:

I

M 127 Finite Mathematics
M 228 Elementary Statistics
SO 350 Social Survey Research

II

M 127 Finite Mathematics
P 301 Statistics for the Behavioral Sciences
P 305 Experimental Methods in Psychology

III

M 127 Finite Mathematics
P 301 Statistics for the Behavioral Sciences
SO 350 Social Survey Research

Scientific Methodology (3 credits)

Scientific methodology is often taken to represent the best example of clear reasoning and is one of the basic methods through which we gain knowledge of the universe. Understanding the methods of science improves the student's ability to reason clearly. In special cases this requirement can be fulfilled by a research course that familiarizes the student with the theory, methods and culture of science. A request for such substitution must be made to the Core Curriculum Committee. The substitution will be approved if the request is accompanied by a proposal for a research project, and if the proposal requires the student to provide a survey of the literature and to discuss methodology, causal relationships observed, and the results and significance of the research.

Students select **one of the following:**

ES 107 Introduction to Engineering
HS 108 History of Science
HU 300 The Nature of Science
PL 240 Philosophy of Science and Technology

Dimensions of Our World . . . . 19 credits

Laboratory Science

Students should understand the methodology of at least one basic science. **One** laboratory course satisfies the requirement:

BI 121	General and Human Biology with Laboratory I
BI 122	General and Human Biology with Laboratory II
BI 253	Biology for Science Majors with Laboratory I
BI 254	Biology for Science Majors with Laboratory II
CH 103 & 104	Introduction to General Chemistry with Laboratory
CH 105	Introduction to General and Organic Chemistry with Laboratory
CH 115 & 117	General Chemistry I with Laboratory
CH 116 & 118	General Chemistry II with Laboratory
EN 101 & 102	Introduction to Environmental Science with Laboratory
PH 100	Introductory Physics with Laboratory

PH 103 General Physics I with Laboratory
PH 104 General Physics II with Laboratory
PH 150 Mechanics, Heat and Waves with Laboratory

Social Sciences

Some breadth of understanding of our society is to be acquired by taking **a basic course in each of two different social science departments.** The following are acceptable choices:

EC 133 Principles of Economics I
EC 134 Principles of Economics II
P 111 Introduction to Psychology
PS 101 Introduction to Politics
PS 121 American Government and Politics
PS 241 International Relations
PS 281-285 Comparative Political Systems
SO 113 Sociology
SO 114 Contemporary Social Problems
SO 221 Cultural Anthropology
SO 390 Sociology of Organizations

History

Western civilizations are studied as a basis for understanding our own society:

HS 102 The Western World in Modern Times

Literature or Philosophy

Students should acquire some depth of understanding of the human condition and of human endeavor. **One** sophomore-level course in literature or philosophy is to be selected from the following courses:

Any literature course at the 200 level or higher, *or*
PL 201 Philosophical Methods
PL 205 Classical Philosophy
PL 206 Modern Philosophy
PL 215 Nature of the Self
PL 222 Ethics

Art, Music or Theatre

Students should study the methodology, history, practice and content of one of the arts. Students must choose **one of the following courses:**

AT 101 Introduction to Studio Art I
AT 231 History of Art I
AT 232 History of Art II
AT 331 Contemporary Art
MU 111 Introduction to Music
MU 112 Introduction to World Music
MU 125-126 Elementary Music Theory
MU 211 History of Rock
T 131 Introduction to the Theatre
T 132 Theatrical Style
T 241 Early World Drama and Theatre
T 242 Modern World Drama and Theatre

Associate's Degree Core Requirements

Students pursuing an associate's degree must satisfy the following core curriculum requirements:

Communication Skills ..... 6 credits
Quantitative Skills ..... 3 credits
Computers ..... 3 credits
Social Sciences (one course) ..... 3 credits
History ..... 3 credits
Art, Music or Theatre ..... 3 credits

These specific requirements are explained in detail above. All core requirements satisfied by the student for the associate's degree will be applied toward the larger bachelor's degree core if the student continues study.

Academic Advising

To assist students in their academic development, the university assigns an academic adviser from the department of each student's chosen field of study. As soon and as often as possible, wise students seek the advice of their academic advisers regarding major requirements, career opportunities, choice of a minor and progress in their major, as well as other areas of personal interest. At the time of registration, the academic advisers assist in and approve course selection. Students also confer with their advisers when adding or dropping courses, and advisers often make referrals to other qualified personnel on campus. The academic adviser is, therefore, the link between the student and the academic regulations of the university.

The Honors Program

The UNH Honors Program is designed for highly motivated students who have shown high levels of

academic achievement. In order to enter the program, a student must have completed at least 24 credit hours with a cumulative grade point average of at least 3.3 at the time the first honors course is undertaken.

Applicants for the program are evaluated on the basis of high school performance, college performance, standardized test (SAT, ACT) scores and recommendations of college teachers.

The Honors Program

The university requires every student, regardless of major, to take a number of core courses in nine general areas. The Honors Program offers students an intellectually exciting and challenging way to satisfy some of these core requirements.

Students in the program take one honors seminar each semester for four semesters. Each seminar actively involves students in problem solving and in inquiry. Topics in the seminars draw from several disciplines and study linkages between disciplines. Each course satisfies one of the university core curriculum requirements.

Some of the Honors Seminars offered recently have included the following:

"Physics and Music: The Persistence of Symmetry." The parallel views of the physicist and the musician were explored to see how these views developed side-by-side and where they diverged.

"Cultural Entrepreneuralism." The cultural importance of Connecticut artifacts were integrated with their potential as sites for tourism and economic development. Historical, cultural, literary and economic impacts were assessed in relation to geography, population, education and cultural expectations.

"Engineering and Society." Relationships between engineering and society were investigated by focusing on environmental concerns.

"Politics and American Art." This course focused on the major styles and motifs in American art and architecture and their relationship to American political history, attitudes and concepts from Colonial times through the 20th century.

"Contexts and Images: African-Americans in Literature and Film." This course provided an opportunity to examine literature and film as integral elements of African-American experience, heritage and culture from the Civil War to the present.

After completing the four honors seminars, students write an honors thesis in their major discipline under the guidance of a professor in the major department. Up to six credits may be awarded for this thesis. The results of the research are to be presented orally to members of the student's major department and to members of the Honors Committee.

In order to remain in the program, students must maintain a cumulative grade point average of at least 3.3 throughout their studies at UNH.

Advantages of the Honors Program

In addition to a challenging and exciting curriculum, the Honors Program offers:

Financial Aid: A student who has successfully completed the four seminar courses described above and one additional semester of work on an honors thesis, all with a cumulative grade point average of 3.3, will be granted a 50% tuition reduction by UNH for the final semester in residence at UNH.

Small Classes: Honors program classes provide an opportunity for participation and discussion in a setting where students know their instructors and their fellow students.

Recognition: A student who successfully completes the honors program, including the honors thesis, will be designated as an Honors Scholar on the transcript and on the diploma awarded at graduation. Thus, prospective employers, graduate schools and other institutions will be aware of this extra accomplishment in the student's pursuit of the undergraduate degree.

Developmental Studies Program

The developmental studies program is designed to strengthen the basic skills of entering students. Courses within the program are taught by members of the faculty of the mathematics department and the English department.

The English department offers three developmental courses: E 101 Academic Reading; E 103 English Fundamentals; and E 114 Oral Exposition. The three courses offer students a comprehensive study of the basic reading, writing and speaking skills necessary in using the English language effectively. M 103 Fundamental Mathematics is taught by the mathematics department.

Placement in these courses is determined by examinations given by the respective departments. Such placement becomes a first priority for affected students because the university believes such students can become successful college students only upon correction of skill deficiencies.

Please note E 101, E 103 and M 103 each carry three college credits but cannot be applied toward students' degree programs. E 103 and M 103 usually meet for up to six hours per week to provide intensive help.

Complete descriptions of the developmental courses appear in this catalog as part of the course offerings of the mathematics department and the English department.

Freshman Year Program

In their first year, college students face a number of new challenges that they never had to cope with during their high school years. The Freshman Year Program at UNH is designed to help students make the transition into this environment.

This program incorporates the talents of more than 40 university personnel, both faculty and staff, and reflects the University of New Haven's commitment to high quality student advising.

During their first semester, all new freshmen are required to take the 10-week team-taught "FE 001 Freshman Experience Seminar," which addresses such topics as the mission of UNH, academic standards, diversity, time and stress management, college life vs. high school life, university relationships, responsible human sexuality, exploration of self, alcohol and substance abuse, and career planning and development. The goal of this seminar is to give students the tools to help them understand and succeed in what can be, and increasingly is becoming, a very competitive environment. FE 001 is mandatory for all incoming full-time Freshmen with no previous college experience.

A second key component of the Freshman Year Program involves matching the freshman class with a team of faculty advisers in order to ensure a low student-faculty ratio. Students will find their faculty advisers readily available for counsel both in their freshman year and beyond.

THE UNIVERSITY COMMUNITY

The University of New Haven encompasses an environment designed to foster the personal growth of its students. Through its programs, services and facilities, it provides the opportunity for students to become involved in meaningful activities which can develop into life-long interests. These activities include recreational, social, community out-reach, professional and, of course, academic pursuits. In addition, the campus provides most of the services needed to assure the comfort and well-being of its students.

Academic Support Services

Academic services are provided to facilitate and enhance students' academic progress through the university by furnishing guided access to advisory sources and ancillary support systems. Many of the available services are described below.

Office of Academic Services

The Office of Academic Services provides a wide range of academic support to day and evening undergraduate students.

- **Academic Skills Counseling**

  The academic skills counselors focus on assisting students to be academically successful. Counselors work with students one-on-one or in small groups to strengthen abilities, make referrals to other qualified personnel on campus, and develop an individualized study strategy which focuses on textbook reading, lecture note-taking, time management, learning/memory and test-taking skills and strategies.

- **Academic Monitoring**

  The staff gathers academic progress information from instructors for specific student populations.

- **Academic Advising**

  As a supplement to departmental advisers, a faculty adviser is available during specified hours for part-time evening students.

Center for Learning Resources

The Center for Learning Resources (CLR) offers free tutoring to students seeking extra help with their studies. The tutoring staff, over 25 instructors in all, is comprised largely of professionals who hold advanced degrees in their fields and who are committed to aiding the learning process. Tutoring is available six days a week throughout each semester.

The CLR includes two labs: The Math Lab offers help with mathematics, science, and business courses; the Writing lab offers help with all writing assignments. Both labs operate primarily on a drop-in basis, but the Writing Lab also offers appointments. The CLR has two computer labs with advanced software packages, which include word-processing, math tutorials, and Internet access. The larger of these labs is available for classroom teaching.

Developmental Studies Program

The developmental studies program is designed to strengthen the basic skills of entering students. Courses within the program are taught by members of the faculty of the Mathematics department and the English department. (See the University Curricula section of this catalog for additional information.)

Freshman Year Advising Program

The Freshman Year Program at UNH is designed to smooth the transition full-time students make as they pass from high school into the substantially different environment of a university. (See the University Curricula section of this catalog for additional information.)

Student Services

The University of New Haven cares deeply about the well-being of its students. A variety of services are available on campus to meet needs ranging from career advising to health care. Every effort is made to accommodate special student needs, such as helping international students to adjust to a new culture or ensuring that classes and facilities are readily accessible to students with disabilities. Many of the available services are described in the following section.

Campus Card Office/Parking Permits

The UNH Campus Card offers many services and advantages for all members of the UNH campus community. The Campus Card is a credit-card sized, color photo identification card. It is to be used as the official UNH library card, residential meal plan card, for security access identification and for a number of other services.

All new students are required to obtain a Campus Card in order to register for a parking permit. The Campus Card must be renewed at the beginning of the Fall term every year by all returning students. Campus Card photos are taken at Echlin Hall on the main campus. Campus Card Office hours are posted at the beginning of each term.

New students may obtain a main campus parking sticker for their cars or motorcycles at the Campus Card Office or at the Campus Police Office located in the lower level of the Campus Booksrore. All cars must display a UNH parking sticker; vehicles parked in violation may be ticketed or towed. Detailed information on parking regulations, violations and reporting of accidents is contained in the *Student Handbook.*

University Police Office

The staff of the University Police Office are certified police officers who undergo continuous training and who have been trained in emergency medical procedures, first aid and CPR. They conduct regularly scheduled campus patrols and work closely with local, state and federal agencies to enforce the laws of the State of Connecticut, especially those most pertinent to campus safety and security. The University Police Office is fully staffed 24 hours/day.

Career Development Office

This office offers employment-related services to the university community. Among these are career counseling, advising, on-campus employment interviewing and extensive information about job opportunities.

Administrative and recruiting offices are located in the Student Center.

Career Development

To assist students in making appropriate career choices, individual/group counseling is available and is supplemented by several office resources. Special workshops on resume preparation, interviewing skills and job research techniques are scheduled in both the fall and spring semesters.

In addition, the office maintains an extensive library of career information, vocational resources, brochures, annual reports and selected periodicals.

A professional career testing service is also available for those students with questions about what career direction to pursue.

Student Employment

During each academic year, employer representatives visit the campus to interview graduating University of New Haven students. While the Career Development Office is not an employment service and does not guarantee jobs, extensive listings of both full- and part-time positions are also maintained to provide a common meeting ground for employers and prospective employees. Students will find this useful, both in locating

part-time and full-time jobs while in school, as well as employment following graduation. Alumni seeking positions are encouraged to use the services of the office.

Employers wishing to list positions need only call or write, giving a description of the position available and other details. There is no placement fee charged for these services.

Information

The CDO publishes updates of recruiter visits in *The Charger Bulletin* as well as information regarding Career Development events, the employment outlook for graduates and job search hints. Career Development information is also provided to *Insight,* the UNH alumni publication.

Cooperative Education

Cooperative Education (Co-op) is an academic support program that enables students to combine career-oriented, paid, full-time or part-time work experience with their college education. Co-op students benefit by being able to explore career interests firsthand, by gaining valuable work experience related to their majors, and by earning money to assist with their college expenses.

How Co-op Works

Students should inquire about Co-op when they begin their degree programs. Work assignments start later, usually at the end of the sophomore year. The keys to a successful Co-op experience are flexibility and preparation. Co-op coordinators advise and counsel students in each academic area, helping students to prepare resumes and develop interview skills.

The flexibility of the UNH Co-op program gives students a chance to schedule plans of study and work which fit their needs. Undergraduate students attend classes for the first two years of college, and they prepare for work assignments which start at the end of the sophomore year. Juniors and seniors alternate classes with co-op work which may last four or six months. Transfer students typically complete one semester on campus and may then enter the co-op cycle, provided they have completed their sophomore year. Individual cases vary and students should review their needs with Co-op coordinators.

The variety and number of co-op employers attest to their recognition that cooperative education is an effective way to identify and train future employees. Active co-op employers include: American Cyanamid, Black & Decker, Corometrics, Dow UT, Dictaphone, Pitney Bowes, Pratt & Whitney, Sikorsky and Remington Products as well as state and federal agencies. Student assignments include computer programming, accounting, counseling, criminal investigation and engineering. Students may live in university housing while doing work assignments in the greater New Haven area, or they may work with their Co-op coordinators to develop jobs closer to home.

Students interested in Co-op will meet with a Co-op coordinator to review eligibility requirements and the plan of study for their degree program. Co-op plans vary, which makes it important for students in the College of Arts and Sciences and in the Schools of Business, Engineering and Applied Science, Public Safety and Professional Studies, and Hospitality and Tourism to take advantage of the individual attention their Co-op coordinators will provide. With this support, Co-op students can combine classroom theory and work experience to make the most of their college careers.

Counseling Center

The Counseling Center offers services designed to help students with problems that may interfere with their academic, social or personal activities. The services provided include confidential personal counseling, academic counseling, vocational counseling and testing, personality assessment and educational assessment.

Office of University Advancement

The Office of University Advancement works with the university community to develop philanthropic support for enhancement of the university's programs, facilities and endowment. Gifts to the university

enhance student financial aid, faculty development, equipment, library resources and other institutional opportunities for growth.

The generosity of corporations, foundations, parents, students, alumni and friends all contribute to the excellence of the University of New Haven.

Services for Students with Disabilities

The Disability Services and Resources (DSR) Office handles all referrals regarding any student with a disability, whether temporary or permanent. The director provides guidance, assistance and information for students with disabilities; coordinates appropriate accommodations in and out of the classroom; and oversees the university's compliance with Section 504 of the H.E.W. Rehabilitation Act of 1973, the Americans with Disabilities Act and other governmental regulations. Referrals and inquiries concerning any matters relating to students with disabilities, accessible facilities and/or reasonable accommodations should be directed to this office.

According to Section 504 and the ADA, it is the responsibility of the students entering post-secondary institutions to identify themselves to appropriate university officials. In order to receive accommodations for a disability at the University of New Haven, students can self-identify by completing and returning a "Prospective Student Request to Initiate Services" postcard and/or by contacting the director of the Disability Services and Resources Office. Documentation of a disability must be submitted to the director of the DSR upon the student's acceptance to the university. ***Documentation of disability is not required to be submitted to the Admissions Office with the application for admission.*** Finally, the student must make a specific request for accommodation of his/her disability. This is done by completing, signing and returning a DSR Student Intake Form to the Director of Disability Services and Resources, and by following established policies and procedures for making arrangements for accommodations each semester/trimester.

The Disability Services and Resources Office is located on the ground level in the rear of Sheffield Hall. The director can be reached by voice/TDD at (203)932-7331.

Health Services Center

The University Health Services Center is open to all university students without charge. Located on the ground level in the rear of the Sheffield Residence Hall, the center is staffed with two registered nurses and part-time physicians. The Health Services Center provides initial care for minor illnesses and injuries, as well as diagnosis, referral and follow-up care for more serious conditions. Also provided is care and counseling in health-related issues. The Health Services Center coordinates the health insurance program that is sponsored by the university.

A part of the health program is a weekly women's clinic which takes place at the health center and covers gynecological problems, birth control and sex-related issues.

One requirement of the health center is that all students entering the Full-Time Division provide documentation of their medical and immunization history by completing the health form provided by the Undergraduate Admissions Office and returning it to the Health Services Center. This requirement is in compliance with the State of Connecticut Health Department's guidelines for immunization and disease control.

To All Students (Full-time undergraduate, part-time undergraduate day and evening, full- and part-time graduate students): Students must provide documentation of two valid measles vaccines. The first must be given after 1/1/69 and that date must be after your first birthday. The second dose must be given after 1/1/80. Also, a rubella vaccine must be given after your first birthday. Blood tests from a laboratory will also be accepted (showing immunity). It is the policy of the university to withhold registration each semester for non-compliance. Proper immunization information must be on file in the Health Services Office.

International Services

The university has a large and active international student program with more than 600 students from more than 50 countries. In addition to assisting students with immigration and adjustment matters, International Services works with the International Student Association to coordinate and plan cultural, educational and social programs.

Multicultural Affairs & Services

The director of Multicultural Affairs and Services works closely with students, faculty and administrators in developing and implementing educational programs for minority students. The office also provides academic and personal advising for students to assist them in their growth and transition into the various facets of the university's environment.

The Office for Multicultural Affairs provides the catalyst for building a support network between the community at large and UNH. Even though the major focus is on issues of Black, Hispanic, Asian and American Indian students, all students are encouraged to take advantage of the financial, academic and personal advising and are invited to participate in the various educational, social and cultural programs.

A minor in Black Studies is offered by the College of Arts and Sciences and housed in the English Department. For information contact the chair of the English Department, Dr. Donald M. Smith.

Residential Life

The character of residential living is often a good indication of the spirit and life on campus. The goal of the University's residential life program is to provide a living/learning environment which promotes academic and personal growth and a sense of community among students. A student's on-campus living experience is considered an integral part of the educational process.

Students live in five residence halls —one freshman hall, and four halls for upperclassmen which are supervised by Resident Directors responsible for the administration of the residence hall. Resident Assistants (RAs) live on each floor and serve as peer advisers, role models, and initiators of activities and programs.

University housing is occupied on an academic year basis, and all freshmen and sophomores are required to live on campus unless they live with a parent or an extended family member. All resident students are required to purchase a university meal plan.

The Office of Residential Life maintains a limited listing of available off-campus housing. Students are responsible for any contract undertaken for housing and should consider carefully the nature of that contract and the responsibilities incurred.

University Dining Services

University Dining Services consist of the Student Center Dining Hall and the Sports Spot, which are located in the Student Center, and the Recharger Convenience Store located in Botwinik Hall.

Students may select from meal plans which include declining balance and board options. Purchasing a meal plan, which is highly recommended for all students, is required for all resident students. Detailed information on meal plans is available at the Dining Services Office.

Student Activities

Being a student at the University of New Haven means having the best of both worlds–an active on-campus community and the city of New Haven. Whether students are interested in cultural, intellectual or social pursuits, they have a wealth of opportunities from which to choose.

The Student Committee on Programs and Events (SCOPE) works cooperatively with the Office of Student Activities to provide a wide variety of events throughout each week. With an increase in the quantity and quality of activities over past years, theme weekends such as Spring Weekend, Family Weekend and Homecoming Weekend have been supplemented by an ongoing activities calendar of weekly events. There are

plenty of opportunities to socialize and interact with fellow students, faculty and staff—whether it be enjoying a band, lecture, comedian or magician; participating in a volunteer opportunity; or taking a bus trip to a regional theater or recreation center.

Students are also encouraged to develop their cultural and intellectual interests by participating in literary, artistic and dramatic events. Visiting artists, play and concert productions, invited lecturers, forums and panel discussions are among the variety of programs that are available to students. Two cultural groups, Orchestra New England and the Alliance Theatre are also in residence on our campus.

Alumni Relations

Membership in the Alumni Association is open to all students upon graduation. Further, any nondegreed alumni completing 12 graduate credit hours after July 1994 are eligible to join. A one-time membership fee is collected with the petition to graduate. New members join the more than 30,000 alumni of the university.

Alumni Association members are entitled to certain benefits including use of the library, services of the Career Development Office and special alumni course auditing rates. Permanent lifetime ID cards issued to Association members soon after graduation entitle alumni to these and other offerings. Contact the Alumni Relations Office for more information.

Insight and *Insight Outlook*, containing news of campus and alumni happenings, are mailed throughout the year. Homecoming, an annual Scholarship Ball, estate planning seminars and other educational and social events offer opportunities for continued contact with UNH and fellow alumni. An active alumni club program provides regional and affinity group opportunities for alumni to network and enjoy other social events. Additional opportunity for active involvement with the association is provided through participation in the annual fund raising campaign.

The Alumni Association is governed by a Board of Directors, elected from members of the association. The directors serve as an advisory group to the university, working to strengthen bonds by promoting communication between alumni and the UNH community.

Athletics/Intramurals/Recreation

Recognizing the importance of a broad range of physical and emotional outlets to a well-balanced college experience, the University of New Haven seeks to involve the student on various levels of active participation in games and sports, as well as to provide an opportunity for community and student support for its varsity intercollegiate program.

Varsity Sports

During the fall, the university offers varsity football for men, men's and women's cross-country and soccer; and women's tennis and women's volleyball. In the winter men's and women's basketball as well as men's and women's indoor track are the main attractions. During the spring, men's baseball and men's volleyball; women's softball; and men's and women's golf, lacrosse and outdoor track and field events keep UNH athletic fields busy.

The athletic department coaching staff welcomes all interested candidates and invites active involvement in and support of its athletic programs.

The University of New Haven is a member of the National Collegiate Athletic Association, the Eastern College Athletic Conference, and the New England Collegiate Conference. Many of the Charger teams have earned national top-20 ranking in recent years, highlighted by the women's basketball team earning the National Championship in 1987. Our nationally ranked football team finished the 1992, 1993 and 1995 seasons undefeated and was selected to participate in the Division II Championship Tournament. Most recently, the football team advanced to the NCAA Division II final game in 1997. Our athletes have traveled extensively throughout the country to Florida, California, Alabama, Illinois, Nebraska, Virginia, South Carolina and Oregon, as well as throughout the Northeast.

Intramural Programs

The intramural department sponsors a variety of events for interested students throughout the year. Tournaments and competition in touch football, basketball, handball, softball, racquetball, table tennis,

tennis and volleyball are offered. Team rosters are available in the athletic office and schedules are posted in the gymnasium.

Athletic Facilities

The North Campus Athletic Complex consists of Robert B. Dodds Stadium (with a multi-purpose, natural surface field designed for football, soccer and lacrosse), Frank Vieira Baseball Field, six tennis courts, a softball field, an intramural field and a gymnasium.

The Charger Gymnasium houses two full-size basketball courts, a fitness center, a racquetball court and locker/shower areas for students and faculty.

A valid university ID card is required for admittance to the Charger Gymnasium or tennis courts during recreational hours. The gymnasium will open for recreation at times when regularly scheduled games and varsity team practices are not in progress.

Clubs and Organizations

More than 30 university student clubs and societies exist for interested students. Included are student chapters of professional societies, community service organizations, social groups and special interest clubs such as the International Student Association, the Black Student Union and the Latin American Student Association.

Fraternities and Sororities

National and local service, social and honorary fraternities and sororities are active on campus. They sponsor programs such as banquets, game shows, the semi-annual Bloodmobile, AIDS Awareness Week, and fund-raisers to benefit charities.

Off-Campus Activities

For those who want a change of pace from the college scene, the university's close proximity to the city of New Haven offers students many cultural opportunities. Musical entertainment ranges from year-round performances of the New Haven Symphony to rock concerts at the New Haven Coliseum to local bands at many downtown clubs. Professional theatre thrives in New Haven at Long Wharf Theater, the Yale Repertory Company and the Shubert. Some of the region's outstanding art collections can be seen on the Yale University campus.

On weekends the Connecticut shore, Cape Cod, the ski slopes of Vermont and New Hampshire, and New York City are just a car or train ride away.

Publications

Student publications include *The Charger Bulletin*, the student newspaper, and *The Chariot*, the annual yearbook. Students may volunteer their services to these student publications by contacting the USGA Office (see below).

Student Government

Separate undergraduare full-, part-time and graduate student councils have the responsibility for initiating, organizing and presenting extracurricular activities and acting as a liaison between students and university staff.

The Undergraduate Student Government Association (USGA) is a forum where undergraduate full-time studenrs provide input to the administration to improve all aspects of the undergraduate education at the university. Student-elected senators represent the voice of their constituencies at weekly USGA meetings.

Students are strongly encouraged to get involved with leadership positions within the student government and other clubs and organizations. The university believes that leadership development is an integral part of all students' education.

The Evening Student Council is a board composed of students attending UNH evening classes. It has three primary objectives: (1) to promote the welfare of the evening student body, (2) to give counsel and encouragement to all evening students as well as to develop and encourage school spirit, and (3) to convey evening students' opinions to the administration and work with the administration in accomplishing student objectives.

Membership in the Evening Student Council is open to all undergraduate evening students enrolled in courses for credit. The council meets regularly and all evening students are invited to participate. In addition to the standard elected officers, student relations and public relations chairs assist the social committee in planning a variety of special events each year.

WNHU Radio

WNHU, the university's student-operated FM stereo broadcast facility, is operated by the communication department of the School of Business. WNHU broadcasts throughout the year on a frequency of 88.7 MHz at a power of 1,700 watts. This extracurricular activity, open to all undergraduate or graduate students, serves southern Connecticut and eastern Long Island with the best in music, news and community affairs programming. The WNHU broadcast day consists of locally produced shows as well as various programs provided by several public networks.

Most WNHU activities in programming, business and engineering operations are performed by students in the university's full-time and part-time undergraduate and graduate divisions. The station will train all qualified students in their respective areas of interest.

Campus Facilities

The university's 78-acre campus contains 25 buildings that offer students modern laboratory and library facilities, the latest in computer technology and equipment, an athletic complex and residential facilities.

Located in West Haven, about 10 minutes from downtown New Haven, the main campus includes administration, library, laboratory, computer and classroom facilities as well as the admissions and financial aid building, bookstore, student center and residence halls. A recent addition to the main campus are two new residence halls, creating a residential quad area.

The South Campus includes Harugari Hall and South Campus Hall, the student records building. The North Campus is the site of the university's athletic fields and gymnasium.

Some of these facilities are described in subsequent sections of the catalog.

Computer Facilities

The University of New Haven maintains many computer laboratories and teaching classrooms at various locations around the campus. The general access computer lab and general access Internet lab, open to all students at the University, are located on the first floor of Echlin Hall. During the undergraduate semesters, these labs are open:

Mondays - Fridays	8:30 a.m. to 11 p.m.
Saturdays	11 a.m. to 11 p.m.
Sundays	11 a.m. to 11 p.m.

The labs are open on an abbreviated schedule at other times during the year. The university also maintains a computer teaching classroom in Maxcy Hall, Room 129, that is open for general student use on a varying schedule throughout the undergraduate semesters. Hours for this lab are posted in both the general access labs and outside of Room 129 in Maxcy Hall.

The general access lab provides students with word processing software, spreadsheet and database management software, SPSS statistical software, Pascal, C, C++ and other programming language compilers and Internet connectivity. Laser printers are available for student use. The general access Internet lab is dedicated to providing students with access to e-mail, World Wide Web and other Internet protocols. The general access labs are staffed by one full-time Information Services Department staff member and several trained student assistants who are available to help anyone who has questions. The hardware and software available in the labs are continuously upgraded as computer technology changes.

Several schools and departments at the university maintain their own computer labs and teaching classrooms. The hours that these labs are open and the resources available are at the discretion of the individual school or department.

Computer facilities provided by UNH as of the Spring of 2000 are as follows:

School of Engineering and Applied Science, Buckman Hall 225 and 225a
School of Engineering and Applied Science Multi-Media Teaching Classroom, Buckman Hall 227
School of Hotel, Restaurant, Tourism and Dietetics Administration, Harugari Hall 114
School of Business Lab and Teaching Classroom, Dodds Hall 103
Department of Biology and Environmental Science, Dodds Hall 305
Department of Visual & Performing Arts/Philosophy, Dodds Hall 413
Department of Computer Science, Echlin Hall 208
Center for Learning Resources Tutorial Lab, Maxcy Hall 106
Center for Learning Resources Teaching Classroom, Maxcy Hall 127
General Access Computer Lab, Echlin Hall 113
General Access Internet Lab, Echlin Hall 115
General Purpose Teaching Classroom, Maxcy Hall 129
UNH Southeastern at New London, CT

Marvin K. Peterson Library

The Marvin K. Peterson Library, named in honor of a former university president, opened in 1974. It includes three floors of reading space, stacks and reference areas. Information is made accessible through manual as well as electronic retrieval methods. Internet access is made available for research purposes. The online catalog is available via the web at http://voyager.newhaven.edu as well as in the library. Materials are stored in a variety of formars including online, print, audio, video, microform and CD-ROM disks. UNH has a CD-ROM collection for accessing materials published in all subjects, including ABI/INFORM, PsycLIT, GPO on Silverplatter, Newspaper Abstracts OnDisc, Dissertation Abstracts OnDisc, the National Trade Data Bank, Census of Population and Housing, Toxic Chemical Release Inventory, and County Business Patterns. Additional resources, including full-text sources, are accessed in online databases such as DIALOG, LEXIS/NEXIS, OCLC, ProQuest Direct, Expanded Academic Index ASAP, Ei Village and Compendex Web, FirstSearch, CCH Online and GPO Access.

The UNH library holdings include approximately 300,000 volumes on the main campus, plus collections in off-campus centers. The library subscribes to hundreds of journals and uses telefacsimile to transmit articles and information between its own and other libraries across the country.

The main library is a U.S. government documents depository library and selects approximately one third of the U.S. government yearly output to support UNH programs.

UNH students may borrow materials from the Albertus College Library. Students who obtain a borrowing card from a Connecticut public library may borrow from other public libraries in the state. As a member of OCLC, UNH has access through interlibrary loan to the holdings of more than 8,650 member libraries' over 39.7 million records.

At the Southeastern Connecticut campus, the UNH library center is housed in the full-service Mitchell College Library. This unique arrangement provides materials from the library, plus a UNH collection of 3,700 monographs, 125 journals and reference materials geared specifically for the UNH curriculum. CD-ROM products and on-line services are also available.

At all sites, students are assisted by professional reference librarians. Freshmen receive instruction in how to use a library. Upperclass and graduate students have subject-specific library orientations available. Bibliographic instruction courses, geared to international students, are also provided.

Library guides, as well as selected instructional support resource materials, are provided; and a reserve collection is in place to support courses taught at UNH.

Campus Store

The university's campus store sells all necessary texts, new and used, required for courses at the university. It also carries school supplies, greeting cards, imprinted clothing, gifts, candy and a selection of paperbacks, newspapers and periodicals. A wide

selection of software is available, priced at a substantial academic discount for currently enrolled students.

The campus store buys back many used texts throughout the year. It also handles class ring orders and film processing for the campus community and will be happy to place special orders for any books.

Students who would like to have books and/or supplies shipped to their home or office may contact the bookstore at (203) 933-4000 or visit the bookstore website at WWW.EFOLLETT.COM.

Campus Copy

Campus Copy is a full-service copy, type and print shop located in the basement of Maxcy Hall on the main campus. Campus Copy offers a variety of services at reasonable prices, including resume composition, word processing, desktop publishing, photocopying and binding. Campus Copy is independently owned and operated. For more information, call (203) 931-9844.

Student Center

The newly renovated Student Center provides a focal point for all student activities. Offering lounges, student offices, a large cafeteria and a snack bar, the facility has been designed to serve as a center for the student's nonacademic college interests.

The Sports Spot, also located in the Student Center, is open daily serving snacks and beverages. Live entertainment and films are often presented in the evenings.

ELS Language Center

Bethel Hall, on the University of New Haven campus, houses the region's site for the ELS Language Centers program. The school provides instruction in English as a second language for a wide variety of purposes including preparation for university study/employment and/or professions requiring English proficiency. Courses include both Intensive and Semi-Intensive instruction, Intensive Preparation for the TOEFL and a new business certificate program in cooperation with UNH. For information, contact the ELS Language Centers school directly at (203) 931-3000.

Research and Professional Facilities

Bureau for Business Research

The Bureau for Business Research offers access to databases for research on products, markets, competition and international issues. In addition, the university's biannual, refereed academic journal, *American Business Review*, is published under the auspices of the bureau.

UNH Foundation

The role of the University of New Haven Foundation is to initiate, facilitate and participate in programs and projects aimed at furthering and improving the educational, scientific and research endeavors at the university.

The entities which are administered under the auspices of the UNH Foundation are: The Center for Family Business, The Institute for Progressive Business Management and the University of New Haven Press.

The University of New Haven Press publishes scholarly texts, monographs and academic publications in a variety of fields including arts and sciences, business, criminal justice, public safety and sports. The press also publishes *The International Sports Journal.*

Center for Family Business

The Center for Family Business was founded in 1994 as a unique learning environment for family business members. Its mission is to help ensure the future and continuity of the family business, thus strengthening Connecticut's economy. The Center offers members a variety of programs which deal with issues faced by family businesses, regardless of the nature of the business. We offer our members eight different major programs each year, many held in

venues in both New Haven County and Fairfield County. These programs feature some of the top speakers in the field of family business and allow attendees to learn from one another. CFB also features small group forums which consist of members in complementary circumstances. These groups function as ad hoc advisory boards to their fellow members. We also hold focused programs periodically, which appeal to particular segments of our membership. Additionally, we provide our members with newsletters and other family business educational materials. In partnership with UNH, CFB is sponsored by the accounting firm of Bailey, Shaefer & Errato; Fleet Bank, a subsidiary of Fleet Financial Group; MassMutual, one of the nation's largest life insurance and financial management companies; and Wiggin & Dana, a leading Connecticut law firm.

The Center for Family Business will provide access to a national family business network and to business programs and services, consultations and seminars.

Center for the Study of Crime Victims' Rights, Remedies and Resources

The UNH Center for the Study of Crime Victims' Rights, Remedies and Resources is maintained under the auspices of the School of Public Safety and Professional Studies. This center will provide, and is in the process of developing, numerous initiatives to enhance the knowledge base regarding crime victim rights and services to assist crime victims through educational, training and technical assistance opportunities for the various academic disciplines and professional groups that study, advocate for or serve victims.

These programs and services will be statewide, regional and national in scope. They will include instructional programs; field and program evaluation research services; internships, fellowships and visiting scholar programs; legal, legislative and public policy analysis and advocacy; and publications, conferences and symposia. Information is available through the director's office at the university.

Institute of Gastronomy and Culinary Arts

A recent addition to UNH, the Institute of Gastronomy and Culinary Arts is housed in the School of Hospitality and Tourism. Featured among its offerings is a program leading to national certification in food handling recognized by the State of Connecticut as well as a certificate of mastery in basic techniques and theories of cooking. The institute serves as a focal point for programs designed not only for UNH students earning academic credits, but also for food writers, restaurant owners and hobbyist cooks. Information is available from the School of Hospitality and Tourism, Harugari Hall.

University of New Haven Press/Academic Publications

The UNH Press publishes scholarly texts, monographs and academic publications in a variety of fields including arts and sciences, business, criminal justice, public safety and sports. One of its newer publications is *The International Sports Journal.* Under the auspices of the Bureau of Business Research, UNH Press also publishes the *American Business Review*, a biannual, refereed academic journal.

The University of New Haven also publishes *Essays in Arts and Sciences*, an interdisciplinary scholarly journal published annually since 1971 and devoted to a broad range of interests including literature, the arts, the social sciences and the natural sciences.

ADMISSION AND REGISTRATION

Division for Full-Time Admissions

Jane C. Sangeloty, B.A., director of undergraduate admissions and financial aid

Call: (203) 932-7319
Toll-free: 1-800-DIAL-UNH
(1-800-342-5864)

The University of New Haven welcomes applications from men and women of all races, economic levels, religions and geographic areas.

Students wishing to take any course in the university, whether or not they seek a degree, must first satisfy the admission requirements and follow the admission procedures specified below. In general, all applicants must have graduated from an accredited secondary school or passed the state high school equivalency examination to be considered for admission.

Students should note that the different schools of the university may have additional admission requirements which are discussed in detail in subsequent pages of this catalog.

You become a student of the University of New Haven only after you have completed the steps listed below under Admission Procedure, selected and registered for courses for your first semester, and made the appropriate tuition and fee payments.

Admission Procedure: New Full-Time Students/Freshmen

- Secure an application form from the Admissions Office of the university or from your high school guidance counselor.
- Submit the completed form with the nonrefundable application fee.
- Request your secondary school to forward an official copy of your academic transcript directly to the Admissions Office. If you are currently attending an educational institution and will be sending us an incomplete transcript, it is your responsibility to send us your final transcript as soon as it becomes available.
- Arrange for results of Scholastic Aptitude Test (SAT) or American College Testing Program (ACT) examinations to be sent directly to the Admissions Office.
- A decision on an application will not be made until we receive: a completed application and application fee, high school and college (if applicable) transcripts and admission test scores. If necessary, recommendations and/or a personal interview may be requested. The university requires all accepted students to submit a $200 enrollment deposit in order to facilitate their registration. The deposit is applied toward the tuition and ensures them of placement with the incoming class, when submitted on or before the due date of May 1. If a student elects to withdraw after May 1st, the deposit is not refundable. Students entering in January must also submit the $200 enrollment deposit upon acceptance. This is nonrefundable after January 1st.
  Please note: Further information on tuition, room and board, and other charges are located elsewhere in this catalog.

Admission Procedure: Full-Time Transfer Students

The university admits transfer students for both fall and spring semesters. The procedure for transfer students to follow when applying to the university is:

- Complete an admission application and return it to

the Undergraduate Admissions Office with the nonrefundable application fee.

- Arrange to have official transcripts from all colleges/universities arrended forwarded to the Undergraduate Admissions Office.
- An official copy of your secondary school transcript, including date of graduation, must also be submitted. A satisfactory General Equivalency Diploma (GED) is acceptable in place of a high school diploma.
- Students who have completed less than one full year (30 semester hours) of college level work must submit official test scores of the Scholastic Aptitude Test (SAT) or American College Test (ACT). Students who have completed more than one full year of college level work are not usually required to submit standardized test scores. However, the Admissions Office reserves the right to request this information if necessary.
- In most cases, transfer students will receive a tentative transfer credit evaluation at the time of acceptance. To help expedite the evaluation procedure, we ask that you forward a current catalog from all institutions attended with your application materials.
- Transfer students will be notified of their tenta-tive transfer credits either before or during the application process, depending on the nature and extent of the evaluation to be completed. To discuss your transfer credits at any time please contact the Transfer Admissions Officer in the Admissions Office.

Admission Procedure: International Students

The university admits international students for both fall and spring semesters. Official academic transcripts from all institutions previously attended, including secondary school, must accompany the admission application. Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). A minimum score of 500 is required.

Students who have been educated in English-speaking systems may substriture the SAT or ACT for the TOEFL. Depending on their academic background, students transferring from accredited institutions within the United States may also be required to submit TOEFL scores. Verification of financial support also must accompany the admission application.

Academically qualified applicants who do not meet the English language proficiency requirements can choose to complete an intensive English program approved by the University of New Haven. The university has an agreement with the ELS Language Center (ELS) located on our campus.

If a student chooses to attend this program, one Certificate of Eligibility (I-20 or IAP-66) will be issued to include both English language training at ELS and undergraduate study at the University of New Haven. For more information about the program, please contact the Director of International Admissions.

Undergraduate Admission Policy

Students are admitted full-time (five-course or four-course, 12-15 credit enrollment and registration load), or part-time (up to 11 credits) or provisionally (requiring summer school). Acceptances are customized and students are placed according to their academic needs. Accepting a student as fully matriculated or as conditionally admitted takes into consideration: GPA, SAT or ACT scores, rank in class and the guidance counselor or teacher recommendation.

Conditional Admission

There are a limited number of openings in the university for students who appear to have potential for academic success that has not been realized. At the discretion of the Director of Admissions, such students may be granted conditional admission to the university.

In order to assist studenrs to be successful, students granted conditional admission may be required to take cerrain courses designed to strengthen their foundation in basic skills and prepare them for regu-

lar college courses. Such students will also be limited to four courses during their first semester. See the Developmental Studies Program section for more information.

Provisional Admission

A provisional admission is intended to enable students with some academic deficiencies, yet overall potential, to bolster the key areas of math and English before enrolling full time at the university. This acceptance requires students to take a group of necessary developmental courses (see the Developmental Studies Program description in the University Curricula section) preceding their matriculation. Upon successful completion of these courses, they may enroll in a full-time curriculum with a maximum of four courses for the first term.

Placement

Incoming students are placed in courses in English and mathematics according to their individual abilities as demonstrated through the university testing program, SAT or ACT scores and high school or previous college records.

Some students may be placed in courses designed to upgrade their skills in particular subject areas and prepare them for more advanced courses at the university.

Deferred Enrollment

Students who are offered admission to the University of New Haven may choose to defer enrollment for up to one full year from the originally intended semester of entrance. Students may enroll in college-level courses at another accredited college or university during this time period with the approval of the Director of Admissions. Students must notify the Admissions Office in writing prior to the beginning of the semester for which they were accepted if they intend to defer their enrollment.

Registration

Registration is the process of selecting classes each term. Registration includes faculty advising, a preliminary choice of classes and fee payment. Final registration is not complete without these steps.

Students have assigned faculty advisers who provide guidance on academic matters and help students with the registration process. Normally, the adviser is the chair or coordinator of the student's major course of study or another faculty member designated by the chair.

There are two parts to registration: the completion of the registration forms and the payment of tuition. There is a penalty fee for delaying either of these two processes beyond the end of the registration period and/or tuition due date.

Registration dates and procedures for currently enrolled full-time students will be posted in advance. A separate registration is required for each of the semesters, for summer sessions and for the winter intersession.

All new students who have paid the enrollment deposit will be mailed information about registration. Prior to the start of the fall and spring semesters, an orientation/registration program is held at which time new students will select their courses.

Social Security numbers will be used on student records; students should be sure to bring their number when registering. Prospective students who do not have a U.S. Social Security number should apply for one before registration. Students from other countries who do not have U.S. Social Security numbers will be given a temporary number by the university; however, they are encouraged to apply for a U.S. Social Security number as soon as possible.

In conjunction with academic advisers, students are urged to plan their programs carefully before completing the registration forms in order to avoid the need for requesting changes. Once the registration is completed, students must use signed drop/add cards to make a change.

Please note: No new full-time student will be permitted to register for classes until:

1. The nonrefundable enrollment deposit has been paid.

2. Tuition in full for the semester has been received. Students relying on financial aid to cover all or part of a semester's expenses must present evidence of the amount of money awarded. No new part-time student will be allowed to register for classes until tuition payment or financial aid arrangements have been made.

Course Overload Restrictions: Full-Time Students

Full-time students who wish to register for more than 15 semester hours in any one semester must follow special procedures and guidelines.

If the total number of courses to be attempted is 6 and is in excess of the hours specified on the student's worksheet, the student must obtain written permission from his or her adviser and department chair and, in most instances, must have a cumulative quality point ratio of 3.20 or higher.

If the total number of courses to be attempted is more than 6, the student must obtain written permission from his or her adviser and department chair, academic dean, and the Provost's Office. Such students are required to have a cumulative quality point ratio of 3.20 or higher.

Course Overload Restrictions: Part-Time and UNH–Southeastern Students

Part-time and UNH–Southeastern students are restricted to a maximum of 11 credit hours in any given term or semester including the combined sessions of summer school.

Students wishing to take more than 11 credit hours per term or semester must complete the Internal Transfer Form in order to change student status to that of a full-time day student. Full-Time Division tuition rates would then apply.

In some limited circumstances, part-time students nearing graduation may be allowed to exceed the 11 credit hour per term policy.

Only students who satisfy the following criteria will be eligible:

1. 12 or more credit hours must be needed for graduation and successful completion of the registered courses would enable graduation.
2. Only courses required for graduation are included.
3. Part-time status was continuously maintained during the previous semester.

Students must apply for this credit overload by obtaining the appropriate form from the office of the Undergraduate Registrar and securing the necessary approvals.

Division for Part-Time Admissions

The Part-Time Evening Division provides the opportunity for both returning adults and traditional-age students to pursue specific program certificates and associate's or bachelor's degrees without the hours per week and financial constraints that full-time study requires. The degrees conferred by the university are identical for both full- and part-time students, with no distinction made for programs completed by part-time study alone.

Students enrolled in the Part-Time Evening Division may register for 1 to 11 credit hours per semester.

Admission Requirements

Generally, graduates of accredited high schools or secondary schools or persons who have a state high school equivalency diploma are eligible for admission.

Information regarding the examination for the state high school equivalency diploma may be obtained by contacting the Connecticut State Department of Education.

In some cases requiring special permission, a person who has completed at least two years of secondary/high school with a satisfactory record may be permitted to register for undergraduate courses as a nonmatriculated student provided that appropriate scores on the university's placement tests or other prerequisite requirements have been met.

With the exception of auditors, all other students

taking any course, whether for a degree or not, must meet admission requirements.

Applicants are required to take placement tests including mechanics of English and mathematics. Scholastic Aptitude Tests or ACT may be required for admission as a part-time student. Applicants who have completed 30 or more credit hours of work with a "C" average or better from an approved, regionally accredited college or university may be exempt from taking placement tests depending on the subject matter of the credit-hour coursework.

Credit for Prior Learning

It is recognized that many adult students have acquired knowledge through approaches other than formal coursework. A variety of procedures exist to measure and validate such academic achievement. Students should contact the Division of Part-Time Admissions for the latest information on crediting procedures.

Some commonly used procedures are:

- Transfer Credits
- College-Level Examination Program (CLEP)
- Proficiency Examination Program (ACT PEP)
- Advanced Placement (AP)
- Dantes Subject Standardized Tests (DSST)
- Servicemembers Opportunity College (SOC)
- Credit by Examination
- Modern Language Association Foreign Language Proficiency Tests (MLA)
- Military Service School Courses
- Further details may be found under External Credit Examinations in the Academic Regulations section of this catalog.

Admission Procedure

Applicants who seek part-time admission should contact the Division for Part-Time Admissions at the Admissions Office in Bayer Hall for specific details.

Registration

New or former students may register in person at the Admissions Office. Currently enrolled students may register by mail prior to the announced deadline. Current students who complete the registration procedure will have a valid registration and can normally be assured a seat in a class. A separate registration is required for each academic term students wish to attend. Auditors follow the same procedure and pay the same tuition and fees as students enrolled for credit.

Payment of Tuition and Fees

The student completes the registration procedure by paying tuition and fees. There is a penalty for delaying either process beyond the end of the registration period.

Students are urged to plan their programs carefully before completing registration forms to avoid the need for changes. Once the registration process has been completed, a change of registration requires the use of drop/add cards.

Alumni Audits

Alumni who audit courses pay a reduced tuition, but must be cleared through the Alumni Office before registering. Auditing courses at this reduced rate is limited to courses at or below the level of the degree earned by the student at UNH.

Certificates

Students can take their first step toward an undergraduate degree by registering for certificates at the University of New Haven.

Each certificate is carefully designed as an introduction to a particular course of study. Later, students may choose to apply the credits they have earned toward an undergraduate degree.

Each certificate consists of a series of courses–of 15 credit hours or more in a specialized area.

Summer Sessions

Day and evening undergraduate courses are offered during the summer in a series of sessions ranging from four to eleven weeks in length. The first session begins

shortly after the close of the spring semester. Resident dormitory students may therefore continue their studies uninterrupted through the entire summer.

The university welcomes visiting students from other colleges and universities who wish to transfer summer course credits back to their institutions. Dormitory facilities are available for summer study. Credits earned at the University of New Haven are generally accepted by other schools, but students are urged to consult with their home institutions for any special requirements or procedures for credit transfer.

University of New Haven students can attend one or more of the UNH summer sessions to lighten their study load during the regular academic year, to reduce the time required for a degree, to prepare for other courses, to make up courses or to take additional work beyond that required for a degree and still complete a program on schedule.

A list of courses offered during the summer is available in April.

Intersession Courses

A number of undergraduate courses are offered during the period between the fall and spring semesters. These courses blend both traditional and innovative methods of instruction, including team teaching, field trips, lectures, laboratory work and research projects. A list of courses offered during intersession is available in November.

Special Programs

Specialized short-term classes, workshops and seminars are offered for students and professionals, and for area public and private organizations. Students may explore new directions, acquire new skills and have the opportunity for personal enrichment as well as keep in step with the latest technology and practices in various fields.

All such programs are staffed by university faculty or by persons recognized as experts in the specific field. Some classes carry CEUs (Continuing Education Units), a nationally recognized measurement that documents the type, quality and time period involved in noncredit coursework.

Related to its mission, UNH offers an array of university and grant-funded activities for elementary, middle and high school students. The activities range from after-school programs to Saturday enrichment courses to intensive academic summer experiences.

Off-Campus Corporate Programs

The University of New Haven can provide credit courses, certificates or complete degree programs at off-campus company facilities. For employees who participate in these programs, on-site instruction is a convenient and economical alternative in professional enrichment. All classes are staffed by UNH faculty members, many of whom are current practitioners in business and industry. The option provides for a more tailored approach in greater flexibility of scheduling and choice of courses. Classes are available during working hours, on shared time or after hours.

In addition to providing instruction at a company, UNH can accommodate employee work schedules with the following services: on-site registration, academic counseling and administration of placement examinations. Also available is a policy which enables employees to defer payment of tuition to the employer with a letter of authorization from the company.

UNH in Southeastern Connecticut

For almost three decades the University of New Haven has been providing quality, affordable undergraduate and graduate educational opportunities for residents in the New London county area and western Rhode Island.

At the undergraduate and graduate levels there are credit offerings in a variety of disciplines including business and engineering. Undergraduate programs include: business administration, general studies, liberal studies, computer science, and engineering. At the

graduate level courses are offered in the areas of business, computer science and education.

In addition to classes open to the general public, UNH–Southeastern offers several programs to the employees of local industries on company premises. These programs include credit and continuing education courses and executive seminars. The UNH–Southeastern staff visit local business and industry representatives periodically in order to inform them of university offerings that may be of interest.

The University of New Haven currently houses its administrative offices in Mitchell Hall on the Mitchell College Campus in New London (mailing address: 469 Pequot Ave., New London, CT 06320). UNH students are able to take advantage of Mitchell College's 64-acre campus, its dining hall, bookstore, library, technology center and tutoring center.

The UNH–Southeastern administrative center accommodates registration, student orientation and advisement, offices and curriculum materials for the university's master's degree program in education and other functions for both undergraduate and graduate students. Classes are held primarily in the early evening, consistent with the schedules of an adult working population.

Admission and registration requirements for all UNH–Southeastern programs are consistent with those for main campus students. Acceptance into a degree program offered in Southeastern Connecticut means that students are enrolled in that same program offered on the main campus. The administrative center assists students through the admissions and degree processes. Faculty, professional staff and support personnel are assigned to the office on a full-time basis.

Professional Development Center

George A. Peacock, M.B.A., director

The Center provides quality consulting and training as well as special noncredit programs to give businesses the tools necessary to compete in today's market place.

Consulting and Training—The Center will provide experienced consultants possessing expertise in specialized areas to assist businesses in remaining competitive in order to maintain and/or create jobs. The training can be offered either at the company's location or at the UNH–Southeastern campus. The Center networks with various state agencies to secure funding for the type of training required by a company. Most classes carry CEUs (Continuing Education Units), a nationally recognized measurement that documents the type, quality and time period involved in noncredit coursework.

Noncredit Programs—Specialized short-term classes, workshops and seminars for students, businesses and professionals are offered in various disciplines concentrating on engineering, finance, human resources and other areas. Emphasis is on providing certification courses which are required by various professional organizations. CEUs may be awarded.

Servicemembers Opportunity Colleges

UNH–Southeastern has been designated as an institutional member of Servicemembers Opportunity Colleges (SOC), a consortium of national higher education associations providing voluntary postsecondary education to members of the military throughout the world. As a member of SOC, UNH–Southeastern recognizes the unique nature of the military lifestyle and has committed itself to easing the transfer of relevant course credits, providing flexible academic residency requirements and crediting learning from appropriate military training and experiences. SOC has been developed jointly by educational representatives of each of the Armed Services, the Office of the Secretary of Defense and a consortium of 12 leading national higher education associations; it is sponsored by the American Association of State Colleges and Universities (AASCU) and the American Association of Community and Junior Colleges (AACJC).

ACADEMIC REGULATIONS

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External Credit Examinations
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Ways of Earning Credit

Academic Credit

Academic credit is granted on a credit hour basis. In addition to successfully completing regular courses, students may earn credit by taking independent study, coordinated courses, crediting exams or CLEP exams, or by transferring previously awarded credit from other institutions. These methods are detailed in the following pages of this section.

Transfer of Credit to the University

Students may transfer to the university after completing academic work at other institutions. Applications should be made to the Dean of Admissions. If feasible, potential transfer students should visit the university and discuss their transfer credit situation with the chair or dean administering the program of interest. Normally, the university accepts credit from regionally accredited colleges on an equivalency basis. The regional institutional accreditation bodies in the U.S. are: Middle States Association of Colleges and Schools, New England Association of Schools and Colleges, North Central Association of Colleges and Schools, Northwest Association of Schools and Colleges, Southern Association of Colleges and Schools, and Western Association of Schools and Colleges.

Students transferring from another institution must possess at least a 2.00 quality point ratio based on a four-point scale. Credit is normally granted for those courses completed with at least a grade of C, or its equivalent. Credit transferred from a two-year institution is generally limited to 60 credit hours and generally restricted to freshman- and sophomore-level courses, unless otherwise approved in writing by the dean of the school in which the student seeks to enroll.

When a student's application is complete, a tentative analysis is made of transfer credit available. Then final decisions on transfer credit are made by department chairs and must conform to school and university policies. Credit is not awarded officially until the student has completed at least 12 credits in good standing at UNH. Prospective students may be required to take qualifying or placement examinations for specific courses.

Plans of study for a University of New Haven degree should be agreed upon by both the transfer student and the department early in the first term of attendance in order to avoid course duplication and academic discontinuity.

Engineering transfer students may be classified as either *Engineering* or *Pre-Engineering*, based on previous preparation. See the section on admission criteria for new transfer students in the School of Engineering and Applied Science section of this catalog.

For Transfer of Student Status, see following pages.

Courses Available at Other Colleges

University of New Haven students interested in taking courses at other colleges and universities should discuss this matter directly with their departments and consult the statement of policy established by the undergraduate school in which they are enrolled.

Coordinated Courses

In order to maintain continuity in a degree program, students are encouraged to use UNH Summer Sessions and Winter Intersession; however, courses taken by matriculated UNH students at regionally accredited institutions may be designated as "coordinated courses." Credit for such courses is accepted and posted on students' permanent records and the grades are included in students' quality point ratios.

Credit for courses taken at a two-year institution is restricted to equivalent UNH courses at the freshman and sophomore levels. Also, students with junior or higher standing at UNH may not take coordinated courses at two-year institutions. Care should be taken in requesting coordinated course credit for courses given during intensive terms. It is UNH policy that intensive terms should span at least 15 meeting days.

Prior authorization for a "coordinated course" designation must be obtained from the department(s) housing the student's major and the analogous course at UNH. The appropriate form must be obtained at the Registrar's Office, approved, and returned to that office before the course in question begins. Normally, approval is only granted for those courses which are analogous to courses offered at UNH and/or are standard courses in a given discipline and unavailable at UNH because of frequency of offerings, cancellation, etc., or inaccessible to the student because of temporary residency at a distant location.

Students must be continuously matriculated at UNH while taking a coordinated course. Approval for a coordinated course will become void upon withdrawal or dismissal of the student.

Students are responsible for securing an official transcript upon completion of their work. Official transcripts must be mailed directly to the Office of the Registrar at UNH.

Advanced Placement

The university recognizes the program of advanced placement available to talented high school students and operated by the College Entrance Examination Board. Students satisfactorily completing advanced placement courses in high school and the final examination prepared by the Educational Testing Service (ETS) may be given appropriate college credit if their courses are similar to those offered at the University of New Haven.

Educational Testing Service Advanced Placement examinations are graded from 1 to 5. Credit is allowed where the grade earned is 3, 4 or 5. Students

desiring to submit advanced placement courses for college credit should have all results of these courses and tests sent in with their application to the Admissions Office.

The University of New Haven accepts credit by examination from the College Level Examination Program (CLEP) subject to academic department chair approval.

The passing percentile for CLEP and subject examinations is 50. Credit will be evaluated by the appropriate department chair.

Credit by Examination

A student who has at least a 2.00 cumulative QPR and has independent knowledge of the content of an undergraduate course offered by the university may, with the approval of the respective department chair and dean, take a special crediting examination in lieu of taking the course.

Students are reminded that they must earn at least 30 semester hours through regular coursework if they are to meet the residency requirements for graduation.

Students may not take crediting examinations during the first or last semesters in which they are enrolled.

External Credit Examinations

Learning which has been acquired through many traditional and nontraditional approaches can be measured and validated by objective procedures acceptable to the faculty of UNH. This learning must appropriately parallel the curriculum of the university in order to be awarded UNH credit.

The Admissions Office maintains a current listing of organizations who provide testing and other alternative credit procedures. The following list cites some of the more common sources:

College-Level Examination Program (CLEP): This testing program offers two types of examinations: (1) the general examinations in the five comprehensive areas of English composition, humanities, social sciences/history, natural sciences and mathematics, and (2) the subject examinations. The subject examinations range in value from three to six credits and are achievement tests in a wide variety of undergraduate college courses, primarily at the basic level. For information, contact CLEP, ETS, Princeton, NJ 08541.

Proficiency Examination Program (ACT PEP): This program may also be used to earn credits in certain academic areas. For information write ACT PEP Coordinator, ACT Proficiency Examination Program, P.O. Box 168, Iowa City, IA 52243.

Dantes Subject Standardized Tests (DSST): This is a program administered by Educational Testing Services (ETS) in conjunction with DANTES. The examinations are available to all military personnel. For information contact the Base Education Services Officer. ETS has made these examinations available to civilians. Civilians should contact the Program Administrator, DSST, ETS, Princeton, NJ 08541.

Servicemembers Opportunity College (SOC): The University of New Haven is a member of the SOC Bachelor Degrees for Soldiers (BDFS) Network. This network is open to members of the armed services and their spouses. For information contact the Admissions Office or the Base Education Services Officer.

Modern Language Association Foreign Language Proficiency Tests (MLA): The MLA comprehensive tests are available in French, German, Italian, Russian and Spanish. Undergraduate students may take Battery A of the examination only. Battery A includes speaking, writing, reading and listening comprehension components.

Military Service School Courses: The university may also accept as transfer credit certain courses completed during in-service training. Veterans should request that official transcripts of in-service training be sent to the Admissions Office at the university.

Army, Navy or Coast Guard veterans should write to: National Personnel Records Center, Military Personnel Records, 9700 Page Boulevard, St. Louis, MO 63132.

Marine Corps veterans should write to: Commandant, U.S. Marine Corps (Code DGK) Headquarters, U.S. Marine Corps, Washington, DC 20308.

Air Force veterans should write to: Community

College of the Air Force, Maxwell Air Force Base, Montgomery, AL 36112.

Enrollees on active duty in the U.S. Armed Forces should arrange for DD Form 295 "Application for the Evaluation of Educational Experiences During Military Service" to be completed and forwarded to the Admissions Office from the duty station. Veterans of any period of active service should provide the university with a copy of DD Form 214 or other notice of separation for each period of service. This may assist in identifying possible sources of academic credit.

Advanced Study

Advanced study courses are offered to qualified students in the departments offering the degrees of bachelor of science or bachelor of arts. These courses may include a thesis, tutorial work or independent study which permits the student to work intensively in areas of special interest.

Independent Study

In all courses of independent study the student and an adviser must jointly file a project outline with the registrar within four weeks of the beginning of the course. This outline shall serve as the basis for determining satisfactory completion of course requirements.

Normally, independent study is restricted to no more than six credits and only open to seniors, juniors and exceptionally qualified sophomores. Students must have at least a 3.0 quality point ratio.

Regularly scheduled courses, that is, those offered at least once every four semesters, are not normally acceptable as independent study.

Field Experiences

In all courses of field experience, including internships, practical theses and work study, students will earn credit for the learning gained through the activity. The student and adviser must jointly file a project outline with the registrar within four weeks of the beginning of the course. This outline shall serve as the basis for establishing the mechanism by which the adviser will evaluate the learning which would occur, and thus for determining completion of course requirements.

Academic Status and Progress

Full-Time Students

Full-time student status is attained by registering for a minimum of 12 charge credits per semester, or equivalent term, on either a matriculated or non-matriculated basis. Such status is continued to a succeeding term provided a minimum of 12 credits are completed in the term of record. Completion is defined as receipt of a letter grade of A + through D -, F, S or U; other letter grades do not signify course completion.

Full-time students are eligible for all daytime student activities and benefits, and are subject to Full-Time Division tuition charges and other relevant fees. It is assumed that full-time students will select the great majority, if not all, of their courses from daytime course schedules, unless needed courses are unavailable during the day.

Part-Time Students

Students who register for 1 through 11 charge credits during a semester maintain part-time status. Part-time status may be held by students attending UNH during the day or in the evening.

Matriculation

Matriculation is the formal act of registering to study for a specific degree offered by the university. Matriculation is, therefore, not automatic. A student must request matriculation by seeking admission to a specific university degree program. Formal acceptance into a degree program shall constitute the granting of matriculation. (For engineering students, see the description of the Pre-Engineering and Engineering program levels in the School of Engineering and Applied Science section of this catalog.)

Students seeking credit to be transferred to another institution, or who wish simply to audit courses or to

take them without working toward a degree, need not matriculate. Nonmatriculated students must register to take their chosen courses, however, and will be allowed to enroll in courses only as space permits. It is the student's responsibility to seek matriculation should he or she later decide to pursue a University of New Haven degree.

Academic Worksheets

Generally, matriculating students are and remain subject to those requirements defined in the undergraduate catalog and listed on the academic worksheet in effect for the semester of initial enrollment.

If students change academic majors, they shall be subject to the requirements of the catalog/ worksheet in effect at the time of the change.

If students officially withdraw or are dismissed from the university and decide to return at a later date, they shall be subject to the requirements of the catalog/worksheet in effect at the time of their return.

Part-time students are permitted a total of three semesters (consecutive or otherwise) break in study during which time they may continue on the original academic worksheet. After the three-semester limit has been reached, students will then be subject to the requirements of the new catalog/worksheet in effect at that time.

If students initiate a leave of absence, they shall continue on the same academic worksheet upon return to the university at the conclusion of the leave. However, students who fail to return after the designated leave of absence period shall be considered withdrawn students and subject to the same requirements as outlined above.

Students who begin their studies based on a catalog/worksheet which subsequently changes may initiate a request to use the most current worksheet for that major; however, students are not required to switch to the current worksheet when a change occurs unless they have been away from the university as described above.

Class

In order to be classified as a sophomore, a student must have completed 27 credit hours in an approved program; a junior, 57 credit hours; a senior, 87 credit hours; a fifth-year student, 117 credit hours.

Transfer of Student Status

Undergraduate students are able to change their student status according to the following procedure:

Day to Evening Transfer. Full-time students who wish to become part-time students may do so by obtaining the Internal Transfer Form in the Registrar's Office. Upon approval, this form is then returned to the Registrar for processing and registration of courses.

Please note: Part-time students are generally restricted to taking courses in the evening and may not exceed 11 credit hours per term.

Evening to Day Transfer. Part-time students who desire to take more than 11 credit hours per term must become full-time students. This process requires the student to obtain the Internal Transfer Form from the Registrar's Office. Upon approval, the form is then brought to the Registrar's Office for processing and registration of courses.

Major

Each matriculated student must designate a specific degree program, called a major. Major program requirements are detailed in the catalog under the relevant department listing. A minimum cumulative 2.0 QPR in major courses is required for graduation. See program requirements for further clarification of specific courses/ requirements.

Minor

Many academic programs have an associated minor program, which normally includes five or six courses. The university encourages students to augment their major program with an associated minor. Details can be obtained from the appropriate department.

A worksheet for the minor, developed by the appropriate department, must be on file with the registrar's office in order to receive credit for the minor.

Grading System

The following grading system is in use since

September 1, 1987 and, except where otherwise specified, applies both to examinations and to term work. The weight of a final examination grade is a matter individually determined by each instructor. See Quality Point Ratio section following for additional information.

A+	–Excellent	= 4.3 quality points
A	–Excellent	= 4.0 quality points
A-	–Excellent	= 3.7 quality points
B+	–Good	= 3.3 quality points
B	–Good	= 3.0 quality points
B-	–Good	= 2.7 quality points
C+	–Fair	= 2.3 quality points
C	–Fair	= 2.0 quality points
C-	–Fair	= 1.7 quality points
D+	–Poor	= 1.3 quality points
D	–Poor	= 1.0 quality points
D-	–Poor, lowest passing grade	= 0.7 quality points
F	–Failure	= 0 quality points

AU –Audit. Indicates course was attended without expectation of credit or grade.

I –Incomplete =0 quality points
Indicates one of the following two possibilities:

1. Some work remains to be completed to gain academic credit for the course. An I is as signed in the first instance at the discretion of the instructor. This assignment shall not be automatic but shall be based upon an evaluation of the student's work completed up to that point and an assessment of the student's ability to complete course requirements within the allowed time limit. Work to remove an I must be performed within the 12 months following the last day of the semester in which the I is incurred or earlier if the instructor so requires. When such work is completed, the instructor will assign a final grade for the course.
2. The student has failed to complete unfulfilled academic assignments within the specified 12 months, and the grade of I has been entered on the student's permanent transcript. **No further opportunity to complete the course will be available to the student after this time.**

DNA –Did Not Attend. Indicates nonattendance in a course for which a student had previously registered but not officially dropped. (0 quality points).

W –Withdrawal. Indicates withdrawal from the course after the first half of the semester, or withdrawal from the university after the twelfth week of classes. The grade of W will not be assigned to any student who has taken the final examination in the course. (0 quality points).

S –Satisfactory. Given only in noncredit courses. (0 quality points).

U –Unsatisfactory. Given only in noncredit courses. (0 quality points).

Grade Reports

Reports of the final grade in each subject will be mailed to the student soon after the close of each semester.

Grade reports are withheld from students who have delinquent accounts with the Business Office, Security, Library, Housing, Athletics or Health Services.

Quality Point Ratio

The academic standing of each student is determined on the basis of the quality point ratio earned each semester. The quality point ratio (QPR) is determined by using the quality points assigned to each student's grade.

The quality point value for each grade earned during a semester is multiplied by the number of credit hours assigned to that course as listed elsewhere in this catalog. The sum of these points is the total number of quality points earned during the semester.

This sum is divided by the number of credit hours attempted (hours from courses with grades of A+ **through** F) to obtain the quality point ratio.

The cumulative quality point ratio is obtained by calculating the quality point ratio for all courses attempted at the University of New Haven. Course grades of **AU, DNA, I, S, U and W** are non-punitive grades. They are not calculated in the overall QPR since they carry no quality points.

See the previous "Grading System" section for more information.

Satisfactory Progress

For students matriculated in the Full-Time Division, satisfactory progress toward a degree is defined as successful completion of 24 credits applicable to that degree program during an academic year. This should include registration for at least 12 credits per semester and successful completion of at least nine credits per semester. "Completion" is defined as the receipt of a final letter grade (A+ to F) but not the receipt of a Withdrawal (W), Did Not Attend (DNA) or an Incomplete (I). "Successful completion" is defined as the receipt of a passing letter grade (A+ to D-). Decisions on student status are made by the Registrar.

Students are required to maintain a minimum cumulative quality point ratio in accordance with the following scale:

Quality point ratio of 1.50 for 3 to 30 credit hours attempted

Quality point ratio of 1.60 for 31 to 45 credit hours attempted

Quality point ratio of 1.70 for 46 to 60 credit hours attempted

Quality point ratio of 1.80 for 61 to 75 credit hours attempted

Quality point ratio of 1.90 for 76 to 90 credit hours attempted

Quality point ratio of 2.00 for 91 or more credit hours attempted

Appeals involving extenuating circumstances may be addressed to the chair of the Faculty Senate for resolution by appropriate Faculty Senate committees.

Dean's List

The dean's list honors students who demonstrate excellence in their academic performance. Full-time students who earn a quality point ratio of 3.50 or better in any one semester will be appointed to the dean's list for that semester.

Part-time students who have accumulated a minimum of 14 credit hours of coursework at the university will automarically be considered for the dean's list at the end of each semester. A cumulative quality point ratio of 3.50 or better is required.

Probation and Dismissal

Failure to maintain satisfactory progress as defined previously will place students on academic probation for the following semester of enrollment. Students are automatically dismissed when they receive a third probation (or, if readmitted from a previous dismissal, any subsequent probation) or when their quality point ratio for any one semester is less than 1.0.

First-semester freshmen earning a quality point ratio less than 1.0 are automatically referred to the Academic Standing and Admissions Committee which may specify conditions for continued enrollment. A record of committee action shall appear on the student's permanent record.

Students who fail to maintain the minimum QPR for satisfactory progress, but are not dismissed, are placed on academic probation. Probation serves as a warning that lack of improvement will eventually prevent satisfaction of graduation requirements. Because UNH is dedicated to helping students to be successful, probationary students are required to work with assigned academic skills counselors.

Students on probation are limited to four courses (13 credits) during the term of their probationary status. They may also be required to retake courses in which they performed poorly. The university may void a registration for more than four courses. Also, any courses above the four course limit taken at another institution during a period of probation will not be accepted in transfer to UNH.

Academic probation of transfer students is determined in accordance with the same graduated, minimum cumulative quality point ratio scale as for nontransfer students detailed above. In determining a transfer student's academic standing, the student's total semester hours completed–those transferred from other colleges plus those received at the University of New Haven–are applied to the minimum cumulative quality point ratio scale.

Repetition of Work

A course which a student has completed may be repeated only with the consent of the chair of the department which offers the course. If a student

achieves a higher grade in the second attempt, that grade rather than the first will be used to compute the cumulative quality point ratio. However, both the higher and lower grades in the course remain in the student's permanent record.

When credit for a graded course previously attempted at UNH is earned through a method which does not carry a grade with a quality point value, the previous instance of that course will be removed from the cumulative QPR calculation. However, both instances will be recorded on the student's permanent record and transcript.

Dismissal/Readmission Procedure

Students are dismissed from the university at the end of each semester or trimester on the basis of the criteria listed in "Probation and Dismissal." Notificarion is made by the University Registrar via certified letter. This letter will specify the time span for appeal (normally five days) and the criteria for appeal.

Upon request by the student, an appeal will be heard by the Academic Standing and Admissions Committee. If the appeal has merit and is granted, the student will be so notified by the University Registrar. The committee may require special arrangements or conditions to allow the student to continue. Satisfaction of such conditions would be a priority obligation for the student.

If there is no appeal or if an appeal is denied, the student will be removed from any pertinent class rolls and will be prohibited from taking any courses at UNH for at least one semester or trimester. The student may continue in any intersession or summer course which began before the date of dismissal, but may not start any courses after dismissal is effective. Dismissal action will be noted on the student's academic transcript.

A third probation will result in dismissal from the university. The student will be allowed to complete any incomplete courses (subject to established rules and restrictions) and grades/credits earned will be transferrable to other institutions. However, the dismissal will remain irrevocable, not subject to appeal.

At the end of the dismissal period, the student may apply for readmission. Refer to the following section on "Readmission."

Readmission

Application for readmission after students have been dismissed normally will be considered only after the lapse of a semester and only when students provide evidence which indicates probable success if readmitted.

Unusual circumstances may permit earlier application if a student's dean and department chair successfully petition the Academic Standing and Admissions Committee to review the applicant's case.

Requests for readmission should be submitted in writing to the Director of Admissions for transfer to the chair of the Academic Standing and Admissions Committee at least three weeks before the opening of the semester, and should include evidence supporting the student's belief that he or she will succeed if readmitted.

A student who has been absent from the university for one or more semesters must submit a new application and pay another application fee. If the student has attended another college or university, an official academic transcript is required from that institution. Following the receipt of the above material, action will be taken on the application for readmission. Since the student is not matriculated at UNH during this period, no coordinated courses will be accepted.

Readmission is not automatic. The Academic Standing and Admissions Committee reviews each application and makes a decision on acceptance, rejection or conditional acceptance of students.

A student who is academically dismissed and readmitted by the Academic Standing and Admissions Committee may be prohibited from continuing with the academic program in which he or she was enrolled at the time of the dismissal. If the Committee readmits the student to a new program, the student shall have the same automatic right to enrollment in that program as any other newly admitted student.

Changes

Dropping/Adding a Class

Students who wish to make a change in class schedule must complete a "Drop Card" or an "Add Card" or both. These are available from the Registrar's Office.

All "Adds" require approval of the instructor and the student's adviser. All "Drops" require approval of the instructor only.

The last date to add classes is two weeks into the semester, and is listed in the academic calendar. No classes may be added after this date. All changes should be completed prior to the second week of class so that students may be properly registered in the correct sections.

Withdrawal from a Class

Students desiring to withdraw formally from a class may do so before the last day to drop courses published in the academic calendar. Formal withdrawal removes the student's name from the class roll and removes the course listing from the student's record and transcript. The student must obtain a "Drop" card from the Registrar's Office, complete it, sign it and obtain the signature of the instructor. The card is then returned to the Registrar's Office.

Students withdrawing from a class after the last day to drop courses will receive a grade for the course as assigned by the faculty. The course and grade will appear on the student's grade report and transcript.

Filing a "Drop" card does not qualify the student for cancellation of any university tuition or fee. Tuition refunds are subject to the refund policy outlined elsewhere in this catalog.

Changing a Major

Students wishing to make a change in major or program must meet with the chair of the department into which they wish to transfer. In consultation with the student, the chair will prepare a change of major form and forward it to the Registrar's Office.

Leave of Absence

Matriculated students may interrupt continuous enrollment by electing to take a leave of absence from the university. The purposes may be for medical or personal reasons, to pursue a program of study at another institution or to engage in other off-campus educational experiences without severing their connection with the University of New Haven through withdrawal. Before taking a leave of absence, students are encouraged to discuss their particular situation with an academic adviser, the dean of their school, or a counselor in the Counseling Center.

The rules regarding leaves of absence are:

- All noninternational students must file for a leave of absence through the Registrar's Office; international students must initiate the leave of absence through the International Services Office.
- Students who are on university disciplinary probation are not eligible for a leave of absence.
- A student who has been dropped or dismissed from the university for disciplinary or academic reasons is not eligible for a leave of absence until properly reinstated.
- A student who has withdrawn as a degree candidate is not eligible for a leave of absence. If a student withdraws while on leave of absence, the leave is invalidated.
- Leaves are not required or granted for summer periods alone.
- Normally, leaves are not approved for a period longer than two semesters. Under special circumstances, a leave of absence may be approved for a maximum of four semesters or two years.
- If a student wishes to return later than the semester originally stated on the leave of absence form, the person must apply for an extension of the leave of absence through the Registrar's Office, not to exceed the maximum period as outlined above.
- A student who plans to enroll for coursework at another accredited institution during a leave of absence should review program plans with his or her academic department adviser to verify eligibility for receiving credit at the University of New Haven.
- Taking a leave of absence may affect a student's financial aid. All students receiving financial aid are encouraged to contact the Financial Aid Office before taking a leave of absence.
- A student who fulfills the conditions of an approved leave of absence may return to the university and register for classes without applying for readmission; the students may preregister for the semester in which they plan to return.

- All applications for leaves of absence after the twelfth week of classes must be approved by the Registrar before they are considered final.
- For leaves of absence completed during the first 12 weeks of the semester, the student's transcript will contain no record of courses attempted or grades received during that semester.
- Leaves of absence completed and approved after the twelfth week of the semester could result in the receipt of the grades for all courses in which the student is registered at the time of taking the leave of absence.

Withdrawal from the University

Students desiring to withdraw from the university must complete the necessary form at the Registrar's Office and notify each of their instructors. It is the student's obligation to complete this formal procedure. Failure to do so leaves the student liable for all of the current semester's tuition and fees, and may result in grades of F being assigned in the student's courses.

Formal withdrawal must be completed during the first four weeks of the semester in order to obtain any cancellation of tuition and fees (as described in this catalog) unless there are clearly extenuating circumstances and a formal appeal is made through the Registrar's Office.

Formal withdrawal which is completed at any time during the first 12 weeks of the semester will assure that the student's transcript will contain no record of courses attempted or grades received during that semester.

Formal withdrawal which is completed after the twelfth week of the semester could result in the receipt of the grades for all courses in which the student is registered at the time of withdrawal. Students should note that formal withdrawal after the twelfth week cannot be regarded as complete unless, in addition to the above requirements, it has been approved by the Registrar.

Because of the serious ramifications of formal withdrawal from the university, students contemplating this action should discuss the matter with their adviser or a counselor as soon as problems are perceived.

Transfer of Credit from the University

Credits may be transferred from the University of New Haven, a fully accredited university, to any other college or university merely by obtaining a letter of authorization from the school to which the transfer of credit is desired.

General Policies

Academic Honesty

Academic dishonesty is not tolerated at the University of New Haven. All students are responsible for reading and understanding the statement on academic honesty in the Student Handbook.

Violation of university standards for academic honesty, including plagiarism, will be a sufficient reason for an F in the course and will be reported to the Vice President for Student Affairs and Athletics. A second violation may be cause for expulsion from the university.

Plagiarism is defined as the unacknowledged use of another person's work or the submission of the same work for more than one course without express written permission in advance.

Attendance Regulations

Every student is expected to attend all regularly scheduled class sessions. Specific course attendance guidelines are established by the academic departments or each individual faculty member.

From time to time, it may become necessary for the university to compile attendance records for every course in order to meet the needs of regulatory agencies, accrediting bodies or for other purposes.

A maximum of two weeks of absences will be permitted for illness and emergencies. The instructor has the right to dismiss from the course any student who has been absent more than the maximum classes allowed. Please refer to the Student Handbook for further clarification of attendance requirements.

If a student attends classes regularly but is not properly registered with the university (see

Registration section elsewhere in this catalog), the instructor has the right to dismiss the student from the course.

Coursework Expectations

All full-time and part-time students are expected to spend at least two hours of time on academic studies outside of and in addition to each hour of class time. This expectation should be used by the student as a guide in determining how much time to spend on academic studies outside of class. It should be used by the student, in consultation with the academic adviser, to help determine the student's course load each semester, so that the course load matches the amount of time available for academic studies.

Make-up Policy

Make-up examinations are a privilege extended to students at the discretion of the instructor, who may grant make-up examinations to those students who miss an examination as the result of a medical problem or a personal emergency. On the other hand, the instructor may simply choose to adopt a "no make-up" policy. If an instructor does choose to offer a make-up test, there are two options: 1) use university proctors, if available, in which case the student must pay a make-up exam fee for regular semester examinations and for final examinations; 2) make private arrangements to offer the examination, in which case the make-up exam fee is charged at the instructor's discretion.

Graduation

Graduation Criteria

Matriculated students are required to submit a petition for graduation in the term immediately preceding their anticipated commencement. Graduation petitions must be signed by the chair of the student's academic department prior to submission of the petition and graduation fee at the Business Office in Maxcy Hall. Petition forms, graduation fees and due dates are published by the Registrar each term.

Graduation is not automatic. Petitions, once filed, ensure that a student's record will be formally assessed in terms of degree requirements, and that it will be submitted to the faculty for final approval. A petition may be denied if graduation requirements are not met. If a petition is approved, a degree will be awarded for the appropriate commencement. Only those students who have successfully completed the graduation requirements listed below can participate in the commencement ceremonies.

A degree will be conferred by the Board of Governors when a student has satisfied all program requirements and has met the following university requirements:

1. successfully petitioned and paid all graduation fees;
2. earned a cumulative quality point ratio of no less than 2.0 in all courses applicable toward the degree;
3. earned a cumulative quality point ratio of no less than 2.0 (or higher if required by individual department) in all courses in the student's major field of study;
4. passed the university's Writing Proficiency Examination;
5. been recommended by the faculty;
6. met all financial and other obligations and conformed to any local, state or federal law concerning graduation;
7. met the residency requirement of the university.

Residency Requirement

The residency requirement of the university is 30 credit hours taken at West Haven or at one of the university's off-campus centers. This requirement applies to all degrees, undergraduate and graduate. Transfer credit, coordinated courses, credit by examination, CLEP, DANTES or proficiency examinations do not fulfill residency requirements.

To ensure depth of study, the residency requirement must include 12 credit hours of work in the declared major for an associate's degree, and 18 credit hours for a bachelor's degree. Exceptions may be granted only by the dean administrating the major.

Writing Proficiency Examination

Because the University of New Haven believes that good writing skills are essential for success, it requires all its undergraduate students to demonstrate such skills before it will confer a bachelor's degree.

All students must pass the university's Writing Proficiency Examination as a requirement for graduation. No student will be eligible to receive the B.A. or B.S. degree unless this examination is passed. All students must take this examination during the first semester after the completion of 57 credit hours. Failure to take the examination may preclude continuous registration.

The examination will consist of the writing of an impromptu theme on one of several topics of current interest. If the student's syntax, punctuation and diction are in accord with the conventions of standard English and if the argument or exposition is clear and coherent, the student will pass. If the student's writing is found to be deficient in these respects, notice of the unsatisfactory performance on the examination will be sent to the student and to the student's academic adviser.

Students who fail the examination must take it again each subsequent semester in which they are enrolled until the examination is passed. Those who fail are encouraged to utilize the services of the Center for Learning Resources or retake E 105 Composition to help them to improve their writing proficiency. Passing E 105 and/or utilizing the Center for Learning Resources does not satisfy the university writing proficiency requirement. In no case shall the requirements for a four-year degree be completed unless the Writing Proficiency Examination has been passed.

Honors

Honors may be conferred upon candidates for graduation according to the following standards:

1. An associate's degree **With Honors** is awarded to students who have a quality point ratio of 3.25 for the credit hours specifically required for the degree program from which they are being graduated and who have taken 30 or more hours of required work at this university.
2. An associate's degree **With High Honors** is awarded to students who have a quality point ratio of 3.50 for the credit hours specifically required for the degree program from which they are being graduated and who have taken 30 or more hours of required work at this university.
3. The bachelor's degree **Cum Laude** is awarded to students graduating with a cumulative quality point ratio of at least 3.50, who have taken 60 or more credit hours of required work at UNH and who have completed all the suggested courses within their curriculum.
4. The bachelor's degree **Magna Cum Laude** is awarded to students graduating with a cumulative quality point ratio of at least 3.70, whose quality point ratio in all courses counting toward their major is at least 3.70, who have taken 60 or more credit hours of required work at UNH, and who have completed all the suggested courses within their curriculum.
5. The bachelor's degree **Summa Cum Laude** is awarded to students graduating with a cumulative quality point ratio of at least 3.90, whose quality point ratio in all courses counting toward their major is at least 3.90, who have taken 60 or more credit hours of required work at UNH, and who have completed all the suggested courses within their curriculum.

In determining eligibility for degrees with honors, transfer credit and credits earned by crediting examination will not be considered. Only the cumulative quality point ratio for courses completed at the University of New Haven is considered in determining a student's eligibility for honors.

TUITION, FEES AND EXPENSES

The tuition and other expenses listed in this section reflect the charges for the 2000–01 academic year.

Full-time students taking courses offered during both the day and /or the evening will pay the full-time tuition rate for the first 17 credits per semester.

Any student who is registered as a full-time day division student on the first day of the semester will be responsible for payment of full-time day division tuition for the entire semester, regardless of any subsequent dropping of credits or withdrawal from a course. Full-time day division students who plan to enroll for less than 12 credits in any given term must change their enrollment status to part-time prior to the first day of the term.

Students enrolled as full-time day division students who take 18 or more credit hours in a single term will be charged additional tuition for each credit hour over 17, unless the additional credits are required for that semester on the student's major worksheet.

International Student Fee

The international student fee is required of all international undergraduate and graduate students when they first enroll. It supports a variety of services and programs, cross-cultural workshops, community activities, international alumni programs, library subscriptions to international newspapers and magazines, and the International Services Office.

Engineering Tuition Differential

Courses with the designations CE, CEN, CH, CM, CS, EE, ES, IE, ME offered by the School of Engineering and Applied Science are charged an additional $60 per credit hour tuition differential.

Student Activity Fee

The student activity fee is distributed to various student groups by the Undergraduate Student Government Association. It covers the cost of student-supported services such as the newspaper and radio station and helps defray the expenses of clubs, organizations, social activities, etc.

Undergraduate Full-Time Day Division 2000–01

Application Fee $25

Payable with student's application to the university.

Enrollment Deposit $200

Payable by all new and transfer domestic students. Fee will be credited toward tuition, but is not refundable after May 1st for students entering in the Fall, and January 1st for students entering in the Spring semester.

Acceptance Fee $200

Payable by all new international students upon notification of acceptance; not refundable.

International Student Fee $200

Tuition, 2000–01, Full-Time Students

	Per Semester	Per Year
Full-time students taking 12-17 credit hours	$7,605	$15,210

Engineering Tuition Differential $60 per credit hour.

Full-Time Division students taking fewer than 12 credit hours, the tuition is $507 per credit hour. Full-Time Division students taking 18 or more credit

hours, additional tuition for each credit hour over 17 is $507.

Student Activity Fee	$105	$210
Health Service Fees		
Domestic Students (prorated in Spring)	$100	$100
International Students (prorated in Spring)	$599	$599
Total Tuition and Fees		
Domestic students	$7,810	$15,520
International students	$8,309	$16,019

Registration Late Fee $25

Late Payment Fees

Assessed for failure to complete payment of tuition, meal plan or residence charge by due dates listed in the academic calendar. $50

Additional fee of 1-1/2 percent per month on the unpaid balance after the first day of classes.

Part-Time Evening Undergraduate Division 2000–01

Application Fee

Payable with the student's application to the university, not refundable. $25

Tuition, 2000–01

Part-Time Division students taking up to 11 credit hours, per credit hour. $290

Engineering Tuition Differential $60 per credit hour.

Registration Late Fee $15

Student Activity Fee, per term $10

Tuition Late Payment Fee

Fifty percent of the tuition for a Part-time Division student must be paid by the due date. $25
The other 50 percent is due by the first week of class. After this, the student must pay 1-1/2 percent per month on the unpaid balance.

Tuition for Summer Session and Winter Intersession

All students pay per credit hour for summer session and winter intersession courses. $290

Tuition, UNH–Southeastern

Students at UNH Southeastern are Part-Time Division students and pay by the credit, per credit hour. $290

Student Activity Fee, per term $10

Room Fees, 2000–01

	Per Semester	Per Year
Undergraduate	$2,095	$4,190
Activity Fee	$ 35	$ 70
Intersession/Summer Session (per week)	$ 135	
Application Fee/ Room Deposit	$ 350*	

* *Nonrefundable if student does not attend; applied to first semester housing fees if enrolled.*

Damage Deposit $ 150

Board Fees, 2000–01

Meal Plans	Per Semester
Plan A (14 meals/week plus declining balance)	$1,350
Plan B (10 meals/week plus declining balance)	$1,300
Plan C (5 meals/week plus declining balance)	$ 1,100

Note: Meal Plan A or B is mandatory for all resident freshman and sophomore students; Meal Plan A, B or C is mandatory for all resident junior and senior students.

Other Fees

Laboratory Fees

Payable each semester by students registering for courses requiring the laboratory fee as

listed in the catalog. Nonrefundable fees are announced in printed course schedules in advance of each semester. (See also the engineering tuition differential described previously.)

Make-up Test

Assessed when a student is permitted to make up an announced test. $10

Make-up Examination

Assessed when a student is permitted to take an end-of-semester examination at a time other than the scheduled time, except for conflicts caused by the examination schedule. $15

Co-op Program

Students participating in the university's cooperative education program pay a continuing registration fee for semesters during which they work. $100

Crediting Exam

Assessed when a student is permitted to take a crediting examination for a 3-credit course. $150

Auditing a Course

Students pay the same tuition and fees for auditing a course as they pay when the course is taken for credit.

Graduation

Assessed regardless of participation in exercises; no reduction will be made for nonattendance. The assessed fee includes a lifetime membership in the UNH Alumni Association. For graduation in May/June, the fee and graduation petition are due no later than March 1 of the year of graduation; for awarding of degrees in August the fee and graduation petition are due by June 15; for January commencement, the fee and graduation petition are due before October 15 of the prior calendar year. Failure to meet the deadline date will result in a late charge of $50 in addition to the normal graduation fee, to be paid if there is sufficient time to process the graduation petition. If processing is not possible, graduation will be postponed to the next award date. $110

Graduation Refiling/Diploma Replacement Fee

This fee is paid to the university to refile for graduation if the student petitioned and failed to complete the requirements prior to the expected graduation date or the fee is paid to the university to replace a lost or damaged diploma. $50

Transcript of Academic Work

One free copy provided at graduation; thereafter, per copy $ 5

Payments

Tuition, fees and other charges are payable when due. Checks or money orders should be made payable to the University of New Haven. There is a penalty charge of $20 per check for all checks returned by the payer's bank.

The university withholds all issuance of grades, the awarding of diplomas, the issuance of transcripts, and the granting of honorable dismissal to any student whose account is in arrears.

The university offers deferred payment choices to help with education expenses. In partnership with Tuition Management Systems (TMS), the nation's top rated education payment plan provider, services provided include an interest-free monthly payment option that allows education expenses to be spread over 10 monthly payments per year for an enrollment fee of $55.

The enrollment fee includes toll-free and Internet access to education payment counselors and account information. In addition, low-interest loan counseling and information is available for those students and families who need loan assistance or for persons who find the monthly payment amounts to be too large.

Information and enrollment forms for TMS are available from the Financial Aid Office or by calling 1-800-722-4867, or at WWW.AFFORD.COM.

Application for this plan must be made prior to the first day of each semester.

Tuition Refund Policy

After a formal withdrawal request is initiated by undergraduate students, tuition is refunded or canceled according to the following scale:

Date of Receipt of Withdrawal Request	Percentage Canceled
1st week of semester	80%
2nd week of semester	60%
3rd week of semester	40%
4th week of semester	20%
After the 4th week	0%

A prorated refund, rather than a refund based on the above-mentioned scale, may be made in situations involving clearly extenuating circumstances such as protracted illness of a student. All appeals for a prorated refund based on extenuating circumstances must be made in writing and include documentation of the extenuating circumstances. Appeals are to be sent to the Directors of Counseling and Health Services; prorated refunds will be determined by the Committee on Withdrawals. All requests for refunds should be initiated before the close of the semester of withdrawal. Any student under the age of 18 must have the written consent of a parent or guardian indicating to whom any refund, if applicable, is to be paid in order to withdraw from the university.

Summer Sessions and Intersession

In cases of withdrawal from a course or courses within the first week of each term, a refund of 50 percent of tuition is made. There is no refund of summer or intersession tuition after the first week.

The foregoing policy is intended to protect the university, since the university plans its expenses and bases its budget on full collection of tuition and fees from all registered students, and assumes the obligation of supplying instruction and other services throughout the year.

Residence Hall Fee and Refund Schedule

The 2000-01 Residence Hall Fee and Refund Schedule is as follows:

1) A $100 nonrefundable housing application fee is required when submitting an application for on-campus housing. This fee is applied to the fall semester housing fees.
2) An additional $250 nonrefundable room deposit is required by June 10 for the fall semester. This deposit generates a room assignment and is applied to fall semester housing fees.
   a) New resident students who do not have this deposit on account on June 10 will not receive a room assignment.
   b) Returning resident students who have chosen a room in the room selection lottery will forfeit the chosen room assignment if this deposit is not on account by June 10.
3) Students who apply for housing after June 10 are required to remit a $350 nonrefundable application fee and room deposit with their housing application.
4) Housing and meal plan fees are billed on a semester basis (June and December).
5) Each student is required to have a $150 damage deposit on account which is billed with the student's initial university invoice containing charges for housing. Students are then responsible for maintaining the damage deposit at the $150 level while a resident student.
6) An activity fee of $35 is billed each semester.
7) All freshmen, sophomore and junior resident students are required to purchase a university meal plan.
8) The housing agreement is binding for the 2000-01 academic year.
   a) Students who cancel their housing agreement for the 2001 spring semester and remain enrolled as a full-time student for the spring semester will be billed for the spring semester housing fees.
   b) Students who are leaving the university must withdraw from housing by January 5, 2001 Withdrawal includes:
      - notifying the Office of Residential Life in writing that the student is leaving university housing,
      - checking out with a Resident Director, and
      - returning all keys to the Office of Residential Life.

   Failure to meet the deadline of January 5, 2001 will result in a charge of $100 which will be deducted from the student's damage deposit.

9) Housing fees are non-refundable after August 28, 2000 and January 22, 2001.

The university reserves the right to make, at any time, whatever changes may be deemed necessary in admission requirements, fees, charges, tuition, faculty, instructors, policies, regulations and academic programs it deems necessary prior to the start of any class, term, semester, trimester or session. The university reserves the right to divide, cancel or reschedule classes or programs if enrollment or other factors so require. All such changes are effective at such times as the proper authorities determine and may apply not only to prospective students but also to those who are already enrolled in the university.

FINANCIAL AID

Jane C. Sangeloty, B.A., director, undergraduate admissions and financial aid

Karen M. Flynn, B.A., M.A., associate director, financial aid

The University of New Haven offers a comprehensive financial aid program, with students receiving assistance in the form of grants, scholarships, student loans and part-time employment. Funds are available from federal and state governments, private sponsors and from university resources. More than 70 percent of the university's full-time undergraduate students receive some form of financial assistance.

Most financial aid awards are based on an individual applicant's demonstration of need. Some funds are available on a merit-basis for students who have exceptional academic records or athletic ability. Need-based awards are available only to U.S. citizens or eligible non-citizens.

Financial aid award decisions are made after a careful consideration of a student's application for assistance. The Financial Aid Office attempts to consider all aspects of a student's financial circumstances in calculating need and attempts to meet the need of aid applicants through a "package" of assistance, generally including a combination of grants, loans and employment.

Students interested in applying for financial aid are encouraged to do so as early as possible. New students must apply by March 15 for the fall semester and December 1st for the spring semester. Returning, upper-class students must submit application materials no later than March 1st. All students are encouraged to apply for aid as early as possible to ensure full consideration for available funds.

Applications completed after the deadline date will be considered on a rolling basis based upon the availability of funds.

The following application materials must be completed and submitted by each financial aid applicant:

- **University of New Haven Financial Aid Application.** The application form must be completed fully and submitted to the Financial Aid Office.
- Free Application for Federal Student Aid. The FAFSA is required to apply for financial aid from federal as well as state and institutional student financial aid programs. Students should list the University of New Haven on the form as one of the colleges authorized to receive this information. The UNH Title IV School Code is 001397. Approximately 4 weeks after the FAFSA is submitted to the Federal Student Aid Program you will receive a Student Aid Report (SAR) directly from the U.S. Department of Education. Applications are available from any Financial Aid Office or High School Guidance Office. Students may also apply online at WWW.FAFSA.ED.GOV.
- **CSS Financial Aid Profile (New and transfer full-time day students only).** The Profile must be filled out and submitted to the College Scholarship Service in Princeton, New Jersey in order to be considered for state and institutional financial aid. The Profile must be completed in addition to the Free Application for Federal Student Aid. You must request that the Profile report be sent to the University of New Haven. Our code is 3663. Be sure to enclose appropriate fee. Students must register with the College Scholarship Service in order to receive a Profile application. To register for an application online, go to WWW.COLLEGEBOARD.ORG or call 1-800-778-6888.
- **Tax Documentation.** Applicants must submit signed copies of both the student's and parent's complete federal income tax returns from the most recent tax year prior to the academic year. Tax forms must include all pertinent schedules. Students filing as independents are not required to submit their parent's tax documentation.

Other forms and documents may be requested from applicants as their aid applications are reviewed. Upon completion of the review of an application, the

Financial Aid Office will notify an applicant of his or her eligibility for financial aid.

Financial Aid Refund Policy

When students are entitled to a refund as a result of withdrawal from courses, refunds of charges and financial aid will be based on the institutional refund policy as described elsewhere in the catalog.

Academic Requirements for the Retention of Financial Aid Eligibility

All students receiving financial aid must be making satisfactory academic progress *and* be in good academic standing in order to be eligible to receive financial aid.

Students receiving financial aid as full-time undergraduates must successfully complete a minimum of 24 credits during the academic year in order to maintain satisfactory progress; full-time students who attend for only one semester during the academic year must complete a minimum of 12 credits. Satisfactory academic progress for part-time students is defined as successful completion of all the credits for which financial aid was awarded.

"Successful completion" is defined as the receipt of a passing letter grade (A+ to D-), and does not include the receipt of an F (Failure), I (Incomplete), DNA (Did Not Attend), or W (Withdrawal). The requirements for good academic standing are described in the "Academic Regulations" section of the catalog.

Major Aid Programs

Grants

Federal Pell Grants–The Pell Grant Program is a federal program providing grant assistance to low income students. Grants for the 2000-01 academic year range from $200-$3,300 with the student's eligibility being determined by the U.S. Department of Education.

SEOG-Federal Supplemental Educational Opportunity Grant–SEOG is a federal progtam to provide grant assistance to exceptionally needy students. Students are selected by the university to receive SEOG Grants.

Connecticut Independent College Student Grant Program–Funds provided by the Connecticut General Assembly are awarded to needy Connecticut residents attending the university.

Capitol Scholarship Program–Connecticut students who have finished in the top 20 percent of their high school class or who have scored 1200 or greater on their combined Scholastic Aptitude Test (SAT) scores may be eligible for the Connecticut Scholastic Achievement Grant. Students must obtain an application from their high school guidance office.

University Grants-in-Aid–University grants are made in all divisions on the basis of need.

"No-Hassle" Academic Scholarship–Incoming full-time freshman students who have a combined SAT score of 1200 or above and rank in the top 15% of their graduating class automatically qualify for a half-tuition scholarship. Awards will be renewed for up to 3 additional years as long as the student maintains a B+ (3.3) cumulative average, remains a full-time student and makes satisfactory academic progress. The deadline is June 1.

Academic Leadership Scholarships–Incoming full-time freshmen with good academic records may automatically qualify for an academic scholarship based on the following criteria.

1200 SAT I and top 20% of class = $5,000
1150 SAT I and top 20% of class = $4,000
1100 SAT I and top 20% of class = $3,500
1050 SAT I and top 20% of class = $3,000

Awards will be renewed for up to three additional years as long as the student maintains a B (3.0) cumulative average, makes satisfactory academic progress and remains a full-time student.

"No-Hassle" Academic Scholarship for Transfer Students–Incoming transfer students who have a minimum of 30 credits transferable to UNH or who hold an associate's degree may qualify for an academic scholarship based on the following scale:

Overall GPA	Award
3.30 - 3.49	$2,500/year
3.50 - 3.69	$3,500/year
3.70 - 4.0	$5,000/year

Students may receive the award for a maximum of seven semesters as long as the student maintains a B+ cumulative average and remains a full-time student. The deadline is June 1.

Athletic Grants-in-Aid–Athletic grants are provided to students for participation in sports. Selection for the awards is made by the athletic department based on students' athletic ability. Awards can range up to a full tuition, room and board scholarship. Athletic grants are available in the following sports:

Men	Women
Baseball	Basketball
Basketball	Cross Country
Cross-Country	Golf
Football	Indoor Track
Golf	Lacrosse
Indoor Track	Soccer
Soccer	Softball
Track and Field	Tennis
Volleyball	Track and Field
	Volleyball

Miscellaneous State Scholarships–Students from selected states may be eligible to apply for state scholarships which can be brought to Connecticut for attendance at the University of New Haven. Students should contact their state scholarship agencies for information.

Donor Scholarships–Many scholarship awards are available each year through the generosity of business firms, charitable organizations and friends of the university. Scholarship funds are awarded from annual gifts from sponsors and from income from the university's endowments.

Loans

Federal Perkins Loan Program (formerly National Direct Student Loan Program)–The Perkins Loan Program is a federal loan program. Repayment on Perkins Loans begins six months after a recipient leaves school and carries a 5 percent rate of interest commencing with the repayment. Students are selected by the university to receive Perkins Loans.

Federal Stafford Student Loan (SSL)–The Stafford Student Loan is a federally subsidized loan program available to students enrolled at least half-time on the basis of financial need. The annual loan limits are as follows:

1st year undergraduate	$2,625
2nd year undergraduate	$3,500
3rd year through completion	$5,500
Graduate Students	$8,500

The interest rate is variable and is subsidized by the federal government while the student is enrolled on at least a half-time basis. Repayment begins six months after graduation or withdrawal from college. Entrance and exit interviews must be conducted with all borrowers in person. The entrance interview must be conducted prior to the student receiving the first student loan check. Exit interviews must be conducted prior to a student's graduation or withdrawal. Students must submit a complete financial aid application.

Unsubsidized Federal Stafford Student Loan–The Unsubsidized Stafford Loan is similar to the Stafford Loan listed above except that it is not based on financial need and there is no in-school interest subsidy. Combined Subsidized and Unsubsidized loans cannot exceed the stated annual loan limits.

Federal Parent Loans for Undergraduate Students (PLUS)–The PLUS Loan Program is a federal program in which parents of dependent students are permitted to apply for up to the cost of attendance minus any financial aid. The interest rate is variable. Application forms and information on this program are available from the Financial Aid Office.

FELP-Family Education Loan Program–FELP is a low interest loan program administered by the Connecticut Higher Education Supplemental Loan Authority (CHESLA). Applicants may borrow from $2,000-$20,000 per academic year at a fixed annual rate. Repayment can be up to 140 months with the option of paying only interest while the student is

enrolled in school. Applicants must be credit worthy. For an application and further information call 1-800-252-FELP (in Connecticut) or (860) 522-0766.

Student Employment

Federal Work-Study Program (FWS)–The Federal Work-Study Program is a federal financial aid program which provides employment opportunities for needy students.

Alternative Financing Options

University Seniors Program–This program offers seniors age 55 or older an opportunity to take an undergraduate course at a reduced rate.

Tuition Management Services (TMS)–The TMS Plan offers a monthly system to pay for educational expenses through regularly scheduled payments over a 10-month contract. This plan carries an enrollment fee, but there are no interest or finance charges. Applications are available at the Financial Aid Office and the Business Office. For further information, contact Tuition Management Services at 1-800-722-4867, at WWW.AFFORD.COM.

The following scholarships are awarded at the discretion of the university and require no special application form–unless otherwise noted.

Alumni Association Scholarships–Merit-based full-time day students with exemplary academic records.

Amity Charitable Trust Fund–An annual award is made from the income of this fund to a worthy, needy student. Preference is given to students from the greater New Haven area. The fund was made possible through the generosity of the Amity Club.

Anthem/Blue Cross & Blue Shield-Joseph F. Duplinsky Scholarship–This award was established by Anthem/Blue Cross & Blue Shield of Connecticut to honor its past chairman, a UNH alumnus. One sophomore is selected annually for a two-year, $5,000 scholarship awarded in the student's junior and senior years, with a paid summer internship at Anthem/Blue Cross & Blue Shield of Connecticut between years. Students must be business administration majors and Connecticut residents. Selection is based on need and academic merit. The company hopes to be able to offer full-time employment to scholarship recipients upon graduation.

Arthur Andersen & Company Scholarship–This is an endowed scholarship for accounting majors who demonstrate both financial need and scholastic ability.

The Barn Sale Scholarship–A scholarship is available each year for a deserving, upper-class disabled student. The award is made possible by an endowment established by the Barn Sale, Inc.

Bayer Scholarships–Established by the Bayer Corporation to provide academic scholarships and paid internships to students in the science and technology fields. Two-year scholarships are awarded to four freshmen who are in the top 20% of their high school class and who earned 1200 or better on the SAT. Students must major in engineering, computer science, biology or forensic science. Students may be eligible to apply for the Bayer internship program for the junior/senior years.

Bayer Preprofessional Internships–All outstanding sophomore students in science and technology with a 3.3 cumulative grade point average or better will be invited to apply for a paid internship. The students selected will also receive half-tuition scholarship for their junior and senior years.

Carmel Benevento Memorial Scholarship–This award is made annually to a woman entering the university as a freshman. The award was established in memory of Carmel Benevento and is based on need and academic and creative ability.

Roland & Margaret Bixler Scholarship–This endowed scholarship is awarded annually. The scholarship was established by Mr. Bixler, who is a member of the UNH Emeritus Board, and his wife, who is co-founder of Friends of the UNH Library.

Norman Botwinik Fund for Academic Excellence–This endowed scholarship is awarded annually to an undergraduate who over a period of four years has demonstrated marked academic achievement. Mr.

Botwinik is the former Chairman of the UNH Board of Governors.

Bozzuto Charity Sports Classic Scholarship–Income from this endowment provides for an annual award to a needy student.

Clarice L. Buckman Scholarship Fund for Chemistry and Chemical Engineering–An annual award to a junior majoring in chemical engineering or chemistry in recognition of achievement and demonstration of incentive.

Chesebrough-Ponds Scholarships–Annual awards are made to minority engineering students with financial need.

Coca-Cola Scholarship–Established by the Coca-Cola Foundation, an award is made annually to an incoming freshman who attended the Connecticut Pre-Engineering Program (CPEP) at any established Connecticut college or university for at least two years. The scholarship is renewable over a five-year period.

Aldo DeDominicis Foundation–Scholarships are awarded annually to students majoring in the field of communications. Awards are based on financial need and academics.

William DeSenti Scholarship–An annual award is made to a needy student in the School of Engineering and Applied Science.

Robert B. Dodds Scholarship–This endowed scholarship is awarded annually to an engineering student. The fund was established by Mr. Dodds as his gift to the Fund for Engineering.

Clarence Dunham Scholarship–A merit-based award is made each year to a deserving student majoring in civil engineering. Selection is made by the faculty of the civil engineering department.

Echlin Family Scholarships–Several annual awards of $2000 are made to needy business or engineering students. The awards are made possible through an endowment established through the generosity of John and Beryl Echlin.

Eder Brothers Scholarships–Annual awards are made to hotel/ restaurant management students. The awards are made possible by Eder Brothers, Inc., of West Haven, Connecticut.

Ernst & Young Scholarship–An award is made each year from this endowment to a student majoring in accounting.

Firelite/Notifier Scholarship–This annual award is made to a junior or senior majoring in electrical, mechanical or industrial engineering or in computer science. The scholarship recipient must participate in a 10-12 week summer internship program at Firelite/Notifier.

James Jacob Gerowin Memorial Scholarship–An award is made to a needy engineering student showing academic promise. The award is in memory of James Gerowin of the Class of 1985.

James Gesso Memorial Scholarship–A memorial award is made annually to an aviation major with academic/extracurricular achievement.

William Randolph Hearst Scholarship–This endowed scholarship is made possible through the generosity of the William Randolph Hearst Foundation. It is awarded annually for first generation and minority students.

Hershey-Frey Scholarship–This endowed scholarship is available to students residing in the Naugatuck Valley. This award is funded through the generosity of the Paul H. Hershey Foundation and Mildred and John Frey.

Paul Kane Memorial Scholarship–An award is available each year to an active scholar-athlete with preference to a Hamden, Connecticut, resident. The award is made in memory of Paul Kane, a university alumnus who was killed in the service of his country.

Nathanial Kaplan Memorial Scholarship–An award in memory of Nathanial Kaplan, a former English professor, is made each year to a student who has been enrolled in the College of Arts and Sciences for at least two years. Student must demonstrate need.

Peggy Leuzzi Memorial Scholarship–An annual scholarship award in memory of Mrs. Leuzzi, a former employee of the university. A scholarship is provided to an incoming freshman woman and is made possible through the generosity of Joseph Macionus.

Martin Luther King, Jr., Memorial Scholarship–An annual awatd in honor of Dr. King is made to a deserving, needy student. Preference is given to minority students.

Ahmed Mandour Memorial Scholarship–An award is available each year to a junior or senior student majoring in economics enrolled as a part-time/evening student. The award is made in memory of Dr. Mandour, a former dean at the university.

Arnold Markle Scholarship–An annual award to a ctiminal justice major in memory of Arnold Markle, former State's Attorney for the Judicial District of New Haven.

Parents Association Scholarship–This is an endowed scholarship funded by the UNH Parents Association.

Virginia M. Parker Scholarship–An award is made each year from this endowed scholarship to an undergraduate woman by Chi Kappa Rho sorority.

H. Pearce Family and Friends Scholarship–This endowed scholarship was made possible through the Pearce Family, longtime friends and supporters of the university. It is awarded to a resident of the State of Connecticut who demonstrates financial need and academic ability.

Marvin K. Peterson-Evening Student Council Scholarship–This scholarship was established by the Evening Student Council of the University of New Haven in 1969 to honor past President Marvin K. Peterson (1953-1973). The scholarship, awarded to undergraduate part-time/evening students, is entirely funded by the Evening Student Council.

Pilot Pen Scholarships–Annual awards are made through the genetosity of the Pilot Pen Corporation. Recipients are selected on the basis of academic achievement.

Public Safety Memorial Scholarship—This memorial provides a full-tuition, four-year scholarship for a surviving spouse or child of a law enforcement officer slain in the line of duty. Recipients are selected by the Connecticut Police Chiefs and Law Enforcement Officers Memorial Foundation. Applications are available ftom the Financial Aid Office.

Rosazza Scholarship–This fund was established in memory of Eugene Rosazza, an alumnus of the university, and is made annually to a needy student with an exemplary academic record.

New Haven Wives of Rotarians–An award is made annually from this endowment to a female from the Greater New Haven area on the basis of academic achievement and need.

Douglas D. Schumann Scholarship–This endowed scholarship is awarded annually, on the basis of personal and academic integrity, to an engineering student who has completed his/her freshman year.

Donald R. Scott Scholarship–This scholarship is in memory of Donald R. Scott, former Chief of Campus Police at UNH, and is awarded jointly by the University of New Haven and the West Haven Black Coalition.

Dany J. Washington Scholarship—This scholarship is in memory of Dany Washington, former Dean of Continuing Education at UNH, and is awarded to nontraditional adult students based on scholarship and leadership displayed in the university or community environment.

COLLEGE OF ARTS AND SCIENCES

Caroline A. Dinegar, Ph.D., interim dean

A liberal education provides excellent preparation for careers and lifetime personal development. The ideals of a liberal education are intellectual and imaginative growth, freedom of thought and inquiry, and a sense of personal worth and responsibility. The active pursuit of wisdom, the enrichment of the spirit and the development of each individual as a person offer the world its best hope for the future.

Recent studies show that such an education prepares college graduates effectively for a career. These graduates are able to adapt to new environments, to think critically and conceptually, to integrate broad ranges of experience, to set goals and develop independence of thought, to seek leadership roles and to possess better overall interpersonal and administrative skills. These studies also reveal that many students educated in the arts and sciences ultimately attain responsible managerial positions in either private or public organizations or in their own businesses following the career preparation provided by a liberal education.

Education is comprised of many elements, and not all education takes place in the classroom or even on the campus. The College of Arts and Sciences sponsors a monthly faculty forum to encourage an exchange of ideas among faculty and students. A guest presenter from amongst the faculty speaks on his/her current research or other area of expertise; students and other faculty members are encouraged to participate in the discussion that follows. In addition, other speakers and performing artists are regularly brought to the University of New Haven campus. Furthermore, the College of Arts and Sciences publishes *Essays in Arts and Sciences*, a nationally distributed, refereed journal; and the university's library offers an excellent collection of books, journals, periodicals, recordings and electronic databases including Infotrac, reQuest and First Search.

New Haven is an exciting cultural center which offers libraries, natural history museums and art museums as well as exhibitions and workshops for dance and the creative arts. Long Wharf Theatre is the home of an excellent regional company offering a varied fare of classics and new plays; the Shubert Performing Arts Center has for many years hosted the finest nationally known performers on its stage; and the Yale Repertory Theatre is innovative and exciting. In addition, the Alliance Theatre is in residence at UNH and produces a variety of dramatic and musical productions, including children's theater presentations.

The campus has a newly renovated university art gallery with shows featuring renowned artists and sculptors scheduled throughout the academic year; also, on.the.wall is a gallery maintained by the Art Department. Both galleries are located in Dodds Hall.

In the area of music, Orchestra New England (ONE) joined the College of Arts and Sciences in 1997. Under the musical direction of Maestro James Sinclair, ONE has developed a fine reputation as the Chambre Orchestra of New England. Founded at Yale in 1974, the orchestra consists of 20-35 principal musicians.

In the College of Arts and Sciences, students are encouraged to pursue a broadly based program of study. The College of Arts and Sciences offers programs leading to the bachelor of arts degree, the bachelor of science degree, and the associate in science, in addition to a number of certificates. Through the Graduate School, the College of Arts and Sciences offers programs leading to the master of arts degree and the master of science degree along with a number of graduate certificates.

Programs and Concentrations

Bachelor of Arts

Art
Chemistry
Communication
English
- Literature
- Writing

Graphic Design
History
Interior Design
- Prearchitecture

Liberal Studies
Mathematics
Music
Music Industry
Music and Sound Recording
Political Science
Psychology
- Community-Clinical
- General Psychology

Bachelor of Science

Biology
- Premedical/Predental/Preveterinary Medical Biology
- Biochemistry
- General Biology

Biotechnology
Dental Hygiene
Environmental Science
Marine Biology
Mathematics
- Computer Science
- Natural Sciences
- Statistics

Music and Sound Recording

Associate in Science

Dental Hygiene
General Studies
Graphic Design
Interior Design

Graduate Programs

Master of Arts

Community Psychology
Industrial/Organizational Psychology

Master of Science

Cellular and Molecular Biology
Education
Environmental Science
Human Nutrition

Graduate Certificates

Applications of Psychology
Geographical Information Systems
International Relations
Legal Studies
Mental Retardation Services
Psychology of Conflict Management

Teaching As a Career

Students interested in earning a teaching certificate to qualify to teach at the elementary, middle or secondary levels may do so by entering the graduate program in education at UNH. This graduate program also offers an internship for interested students.

Minors

It is highly recommended that students working toward a degree in one area of study give serious thought to organizing their elective courses so as to receive a minor in a second discipline. A minor usually consists of 18 credit hours devoted to the study of either a group of courses on related subjects or a series of courses offered by one department.

Students interested in studying for a minor should consult with the chair of the department offering the minor.

Certificates

Students can take their first step toward an undergraduate degree by registering for one of the certificates offered by the College of Arts and Sciences.

Each certificate is carefully designed as a concentrated introduction to a particular subject area and generally consists of courses totaling 15 to 18 credit hours.

Later, students may choose to apply the certificate credits they have earned toward their undergraduate degree at the university.

Certificates

Art
Graphic Design
Interior Design
Journalism
Paralegal Studies
Public Policy

Admission Criteria

An applicant for admission to the College of Arts and Sciences must be a graduate of an approved secondary school or the equivalent. While no set program of high school subjects is prescribed, an applicant must meet the standard of the university in respect to the high school average. Applicants must present 15 acceptable units of satisfactory work, including nine or more units of college preparatory subjects. Satisfactory scores on College Entrance Examination Board (SAT) or American College Testing (ACT) program tests are required.

University Core Curriculum

In addition to department requirements, students must fulfill all requirements of the core curriculum.

General Policies in the College of Arts and Sciences:

- Each student will be assigned an academic adviser.
- A student may select a minor after consultation with the adviser or the appropriate chair.
- To receive a degree from the College of Arts and Sciences, the last 30 credits must be awarded by the University of New Haven.
- A minimum of 120 semester hours is required for graduation.

Coordinated Course Policy:

To implement the university's Coordinated Course Policy, the College of Arts and Sciences has adopted the following additional guidelines:

1. A student may take a maximum of two Arts and Sciences courses on a coordinated basis. The courses must be either: (a) upper-division courses, that is, equivalent to 300- or 400-level courses at UNH; or (b) courses required by the student's major program, that is, not Arts and Sciences elective courses.
2. Coordinated courses from two-year colleges will be accepted only for students who have freshman or sophomore status at UNH. A student who has completed a total of 57 credit hours cannot obtain consent for a coordinated course taken at a two-year college.
3. Any exceptions to the previously stated guidelines must be approved by the dean of the College of Arts and Sciences.
4. Students should note that in all cases they must seek approval before taking a coordinated course.

B.A., Liberal Studies

The B.A. in liberal studies serves students whose needs are not met by traditional university majors. The interdisciplinary nature of this program permits students to integrate courses from several departments for the achievement of personalized educational goals. Those goals may be directed toward the realization of specific career objectives not met by an existing program. The liberal studies program also meets the needs of students who need to develop a career focus and who wish to learn in a manner that emphasizes the inter-relatedness of knowledge.

All students earning a bachelor's degree in liberal studies must complete the university's core curriculum

requirements as part of the 120-122 credits required for the degree.

Students will also select a minimum of 16 focus area courses—that is, eight courses from two of the three focus areas listed below. The number of focus area courses within a field/department is a minimum of three and a maximum of six courses from any one discipline. Selection of 48 credits (or more) of courses from within these focus areas ensures a breadth of study within the liberal studies program.

Focus Areas

Humanities:

Art
Communication
English
History
Music
Philosophy

Social/Behavioral Sciences:

Black Studies
Economics
Paralegal Studies
Political Science
Psychology
Sociology

Mathematics/Science:

Biology
Chemistry
Environmental Science
Mathematics
Physics

In consultation with the Arts and Sciences adviser, students will develop a personal plan of study. Finally, as part of this plan, students will select a departmental adviser to assist in the development of an elective sequence of 39 credits (or less) to support their academic/professional goals. Students may choose their elective sequence from the areas of arts and sciences, business, engineering, hospitality/tourism or public safety/professional studies. Ten 300-level courses must be taken.

A.S., General Studies

The College of Arts and Sciences offers the A.S. in general studies to serve two different student populations. The first is the new or returning student who wishes a general liberal arts education for personal enrichment. The second type of student is the one who is undecided about career objectives and wishes to defer the choice of a major field.

Nearly half of the 61 credit hours required for the degree are free electives. This flexibility permits the student to take courses in a number of different fields prior to choosing a major. By judicious choice of electives, it is possible to transfer into majors in any of the schools in the university.

Students planning to transfer to four-year programs in the College of Arts and Sciences should note additional core requirements in science and mathematics, English literature, art and social science, as well as special requirements in particular major programs.

Required Courses

Students must complete 61 credit hours of courses to earn the associate's degree with a general studies major, including the courses listed below:

E 105 Composition (cc)
E 110 Composition and Literature (cc)
HS 102 The Western World in Modern Times (cc)
Plus 1 mathematics course: M 109 *or* M 127 *or* higher (cc)
1 literature or philosophy course* (cc)
1 art, or music, or theatre course* (cc)
1 computer course* (cc)
1 science course with laboratory* (cc)
4 social science courses: EC 133, P 111, PS 121 and SO 113 (cc)

cc—Course which satisfies the University Core Curriculum requirements.

*—*Courses chosen from the University Core Curriculum listing.*

Department of Biology and Environmental Science

Chair: Michael J. Rossi, Ph.D., University of Kentucky

Professors Emeriti: Dinwiddie C. Reams, Jr., D.Eng., Yale University (*deceased*); Burton C. Staugaard, Ph.D., University of Connecticut; H. Fessenden Wright, Ph.D., Cornell University

Professors: R. Laurence Davis, Ph.D., University of Rochester; Charles L. Vigue, Ph.D., North Carolina State University; Henry E. Voegeli, Ph.D., University of Rhode Island

Associate Professors: Roman N. Zajac, Ph.D., University of Connecticut; Michael J. Rossi, Ph.D., University of Kentucky

Assistant Professor: David Osgood, Ph.D., University of Virginia

Instructor: James Ayers, M.S., Southern Connecticut State University

Practitioners-in-Residence: Norman Abell, D.P.M., Ohio College of Podiatric Medicine; Daniel A. DePodesta, M.B.A., Quinnipiac College; George Mack, J.D., University of Connecticut; Anthony Rossomando, University of Virginia; Eva Sapi, Ph.D., Eotvos Lorand University

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the College of Arts and Sciences.

Biology

Biology provides one of the cornerstones of a liberal education by increasing the knowledge and appreciation of oneself and of other living organisms in the ecosphere. It is an active and exciting field leading to careers in drug discovery, medicine, and education. As a major, biology prepares the student for professional or graduate training, or for technical and research positions in one of the health or life science fields.

B.S., Biology

Students earning a B.S. with a major in biology must complete 122-124 credit hours. Courses include the university's core requirements and the course requirements for their particular biology concentration as indicated below.

Concentration in Premedical/Predental/Preveterinary Medical Biology

This concentration gives the student the basic entrance requirements of virtually every U.S. college of medicine, dentistry and veterinary medicine. Entrance into these colleges is highly competitive and completion of the concentration does not guarantee acceptance into a medical, dental or veterinary medical college. Graduates have gone on to pursue medical, dental and veterinary medical degrees at such schools as Georgetown University, Tufts University, University of Connecticut, Ohio State University and the University of Tennessee. Students who complete the program but decide not to pursue a medical career are highly qualified to enter the workforce in one of the technically oriented research, health, or related life science fields. In addition to the university's core requirements and seven free electives, the following courses are required:

BI	253-254	Biology for Science Majors with Laboratory I and II
BI	301	Microbiology with Laboratory
BI	308	Cell Biology with Laboratory
BI	311	Genetics and Molecular Biology with Laboratory
BI	461	Biochemistry with Laboratory
BI	595	Laboratory Research I
CH	115-116	General Chemistry I and II
CH	117-118	General Chemistry I and II Laboratory

CH	201-202	Organic Chemistry I and II
CH	203-204	Organic Chemistry I and II Laboratory
PH	103-104	General Physics I and II with Laboratory
CH	211	Quantitative Analysis with Laboratory
M	117	Calculus I
M	228	Elementary Statistics

Plus three of the following:

BI	303	Cells and Tissues with Laboratory
BI	304	Immunology with Laboratory
BI	305	Developmental Biology with Laboratory
BI	309-310	Vertebrate Anatomy and Physiology with Laboratory I and II
CH	221	Instrumental Methods of Analysis with Laboratory

Concentration in Biochemistry

This concentration is most appropriate for those students interested in a career in the rapidly growing fields of biotechnology and biomedical/pharmaceutical research, or for those interested in pursuing an advanced degree in biochemistry or molecular biology. The program offers extensive hands-on experience in biochemical, cellular and molecular techniques. Recent graduates from this program are employed at Bristol-Myers Squibb, Protein Sciences, Bayer Corporation, Pfizer, U.S. Surgical, Neurogen Corporation, Cytotherapeutics, Curagen and Yale University School of Medicine. In addition to the university's core requirements and seven free electives the following courses are required:

BI	253-254	Biology for Science Majors with Laboratory I and II
BI	301	Microbiology with Laboratory
BI	304	Immunology with Laboratory
BI	308	Cell Biology with Laboratory
BI	311	Genetics and Molecular Biology with Laboratory
BI	461	Biochemistry with Laboratory
BI	501	Protein Biochemistry and Enzymology
BI	502	Biochemistry of Bioenergetics
BI	503	Biochemistry of Information Pathways
BI	595	Laboratory Research I
CH	115-116	General Chemistry I and II
CH	117-118	General Chemistry I and II Laboratory
CH	201-202	Organic Chemistry I and II
CH	203-204	Organic Chemistry I and II Laboratory
CH	221	Instrumental Methods of Analysis with Laboratory
PH	103-104	General Physics I and II with Laboratory
M	117	Calculus I
M	228	Elementary Statistics

Concentration in General Biology

This concentration gives the student a general overview of the biological sciences. It is appropriate for the student with a broad interest in biology. In addition to the university's core requirements and six free electives, the following courses are required:

BI	253-254	Biology for Science Majors with Laboratory I and II
BI	301	Microbiology with Laboratory
BI	308	Cell Biology with Laboratory
BI	311	Genetics and Molecular Biology with Laboratory
BI	461	Biochemistry with Laboratory
BI	595	Laboratory Research I
CH	115-116	General Chemistry I and II
CH	117-118	General Chemistry I and II Laboratory
CH	201-202	Organic Chemistry I and II
CH	203-204	Organic Chemistry I and II Laboratory
PH	103-104	General Physics I and II with Laboratory
M	117	Calculus I
M	228	Elementary Statistics

Plus four of the following courses:

BI	303	Cells and Tissues with Laboratory
BI	304	Immunology with Laboratory
BI	305	Developmental Biology with Laboratory
BI	309-310	Vertebrate Anatomy and Physiology with Laboratory I and II
BI	510	Environmental Health
CH	221	Instrumental Methods of Analysis with Laboratory

EN	500	Environmental Geoscience
EN	501	Principles of Ecology

B.S., Biotechnology

The bachelor of science in biotechnology program is designed to prepare students to enter the growing biopharmaceutical and biotechnical fields. The program integrates courses in biochemistry, genetics, and cellular and molecular biology.

All students earning a B.S. with a major in biotechnology must complete 128 credit hours. Courses include the core requirements of the university, the required courses listed below and elective courses.

Required Courses

BI	253-254	Biology for Science Majors with Laboratory I and II
BI	301	Microbiology with Laboratory
BI	303	Cells and Tissues with Laboratory
BI	304	Immunology with Laboratory
BI	308	Cell Biology with Laboratory
BI	311	Genetics and Molecular Biology with Laboratory
BI	461	Biochemistry with Laboratory
BI	511	Molecular Biology of Proteins with Laboratory
BI	513	Molecular Biology of Nucleic Acid with Laboratory
BI	595	Laboratory Research I
CH	115-116	General Chemistry I and II
CH	117-118	General Chemistry Laboratory I and II
CH	201-202	Organic Chemistry I and II
CH	203-204	Organic Chemistry Laboratory I & II
CH	221	Instrumental Methods of Analysis with Laboratory
M	117	Calculus I
M	228	Elementary Statistics
PH	103-104	General Physics I and II with Laboratory

Environmental Science

Environmental scientists are employed by municipal, state and federal agencies, and by consulting companies and businesses both large and small. They work on such problems as wetland mapping and protection; watershed management; ground and surface water contamination; aquifer delineation and protection; marine resource management; crop and pest management; natural hazards; regulatory compliance; environmental health and safety; water, wastewater and air treatment; and pollution prevention and remediation.

Usually, specialized training is necessary if one eventually wishes to hold an administrative job at a high salary level. These programs are designed to enable students to enter a graduate or specialty school to continue their education. Examples of advanced study would be a graduate program in environmental science or engineering; a school of forestry, planning or public health; a program in urban ecology or environmental geology; or even, with proper selection of electives, business or law school.

The B.S. degree program establishes a solid background in the biological and earth sciences, chemistry, physics and mathematics in the first three years. In the fourth year students concentrate on advanced environmental science courses.

A combined five-year B.S./M.S. program in environmental science is offered to students who have completed approximately 75 credit hours (five semesters) of undergraduate work, have at least a 3.0 grade point average and are recommended by the department.

B.S., Environmental Science

Required Courses

All students earning a bachelor's degree in environmental science must complete the core requirements of the university and the courses listed below:

EN	101	Introduction to Environmental Science
EN	102	Environmental Science Laboratory
EN	500	Environmental Geoscience
EN	502	Environmental Effects of Pollutants
BI	253-254	Biology for Science Majors I and II with Laboratory
BI	320	Ecology with Laboratory
BI	510	Environmental Health
CH	115-116	General Chemistry I and II

CH	117-118	General Chemistry Laboratory I and II
CH	211	Quantitative Analysis with Laboratory
CH	221	Instrumental Methods of Analysis with Laboratory
PH	103-104	General Physics I and II with Laboratory
M	228	Elementary Statistics

Plus 12 to 16 credit hours of biology, science or chemistry electives and a restricted chemistry elective.

M	109	Intermediate Algebra and M 115 Pre-Calculus, *or* M 115 Pre-Calculus and M 117 Calculus I, *or* M 117-118 Calculus I and II
CH	201-202	Organic Chemistry I and II, and CH 203-204 Organic Chemistry Laboratory I and II

B.S., Marine Biology

This program is designed to prepare students to enter the rapidly expanding fields of resource management, environmental assessment and protection, biotechnology and education related to estuarine, coastal and marine environments. The level of experience required for an individual to contribute in these fields is not adequately satisfied by an undergraduate degree in biology or environmental science; therefore, individuals with specific, advanced and focused training are needed. This program, with a strong, basic emphasis on the biological and chemical sciences, will prepare students for these fields.

Required Courses

All students majoring in marine biology must complete the core requirements of the university and the following courses:

BI	253-254	Biology for Science Majors with Laboratory I and II
BI	301	Microbiology with Laboratory
BI	320	Ecology with Laboratory
BI	350	Invertebrate Zoology with Laboratory
BI	461	Biochemistry with Laboratory
CH	115-116	General Chemistry I and II
CH	117-118	General Chemistry Laboratory I and II
CH	201-202	Organic Chemistry I and II
CH	203-204	Organic Chemistry Laboratory I and II
M	117	Calculus I
M	228	Elementary Statistics
MR	200	Fundamentals of Oceanography
MR	300	Marine Ecology with Laboratory
MR	310	Marine Botany with Laboratory
MR	320	Marine Pollution
MR	501-502	Senior Project in Marine Biology I & II
PH	103-104	General Physics I and II with Laboratory

Plus two of the following:

CH 221	Instrumental Methods of Analysis with Laboratory
EN 533	Special Topics in Field Geology
EN 540	Introduction to Geographical Information Systems
MR 330	Coastal Resources and Management
MR 331	Marine Conservation and Restoration
MR 410	Marine Aquaculture and Biotechnology
MR 420	Marine Biogeochemistry with Laboratory

Plus one of the following:

BI 308	Cell Biology with Laboratory
BI 311	Genetics and Molecular Biology with Laboratory

Plus two electives

Minor in Environmental Science

The minor in environmental science provides a useful background for students majoring in many other areas of study if they have concern for the environment. For example, students majoring in political science might well combine their program with a minor in environmental science. Another useful combination is an environmental science minor and a major in business administration or engineering.

For specific information concerning a minor in environmental science, please consult with the department chair.

Minor in Biology

To minor in biology, students must complete those

courses listed below. In some instances, an upper-level biology course can be substituted for general biology.

BI 121-122	General and Human Biology with Laboratory I and II, or BI 253-254 Biology for Science Majors with Laboratory I and II
BI 261	Introduction to Biochemistry, or BI 461 Biochemistry with Laboratory
BI 301	Microbiology with Laboratory
BI 308	Cell Biology with Laboratory
BI 311	Genetics and Molecular Biology with Laboratory

Minor in Bioengineering

No rigid group of courses constitutes a minor in bioengineering. Students wishing to follow such a program should major in one aspect of engineering and take a minor (20 credit hours) in biology; or the biology major program may be combined with a minor or concentration in engineering. Consultation with the particular engineering and biology department chairs should be made before starting the program.

Teaching Biology

Students interested in earning a teaching certificate in secondary education in biology may enter the graduate program at UNH. The B.S. in biology with a concentration in General Biology is the best choice for a major for those planning to teach at the secondary level, but other related majors are also acceptable. Students interested in teaching science at the middle school level need a variety of science courses, including biology. Please contact the education department for additional information.

Department of Chemistry and Chemical Engineering

The department of chemistry and chemical engineering resides in the School of Engineering and Applied Science, but offers the B.A. in chemistry degree program through the College of Arts and Sciences. Please see the departmental listing in the School of Engineering and Applied Science section of the catalog for additional information, including a list of faculty members and details on other degree programs offered by the department.

B.A., Chemistry

This program is designed to provide a traditional liberal arts background with the basic requirements of a chemistry major.

Required Courses

All students in the B.A. in chemistry program must complete 125 credit hours. These courses must include the university core requirements and the courses listed below:

CH 115-116	General Chemistry I and II
CH 117-118	General Chemistry I and II with Laboratory
CH 201-202	Organic Chemistry I and II
CH 203-204	Organic Chemistry I and II Laboratory
CH 211	Quantitative Analysis with Laboratory
CH 221	Instrumental Methods of Analysis with Laboratory
CH 331-332	Physical Chemistry I and II
CH 333-334	Physical Chemistry I and II Laboratory
CH 341	Synthetic Methods in Chemistry
CH 411	Chemical Literature
CH 412	Seminar
CH 501	Advanced Organic Chemistry
CH 521	Advanced Inorganic Chemistry
EC 133	Principles of Economics
M 117-118	Calculus I and II
M 203	Calculus III
PH 150	Mechanics, Heat and Waves with Laboratory
PH 205	Electromagnetism and Optics with Laboratory

Plus 30 credit hours of electives.

B.S., A.S., Chemical Engineering

B.S., A.S., Chemistry

Minor in Chemistry

These programs appear in this catalog under the School of Engineering and Applied Science.

Teaching Chemistry

Students interested in earning a teaching certificate in secondary education in chemistry may enter the graduate program at UNH. The B.A. or B.S. in chemistry is the best choice for a major for those planning to teach at the secondary level, but other related majors are also acceptable. Students interested in teaching science at the middle school level need a variety of science courses, including chemistry. Please contact the education department for additional information.

Department of Communication

The department of communication resides in the School of Business. The B.A. in communication and the A.S. in journalism degree programs and the journalism certificate are offered through the College of Arts and Sciences. Please see the departmental listing in the School of Business section of the catalog for additional information, including a list of faculty members and details on other degree programs offered by the department.

The communication program at the university allows each student to develop interpersonal and mass communication competencies, skills and awareness through a sequence of course offerings.

Internships are available in a number of regional businesses and nonprofit organizations and in both print and broadcast media.

More information about the bachelor's degree programs in communication is provided under the School of Business section in this catalog. Also included are course listings and information concerning communication as a minor field of study.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the College of Arts and Sciences.

B.A., Communication

The University of New Haven offers a B.A. and a B.S. in communication.

The bachelor of arts degree program carries a strong journalism and public relations concentration. In addition, interpersonal communication theory is emphasized, giving the student a broad background in all the elements of the communication field.

Required Courses

All students in the B.A. in communication program must complete 121 credit hours. These courses must include the university core requirements and the following courses:

CO 100 Human Communication
CO 101 Fundamentals of Mass Communication
CO 102 Writing for the Media
CO 205 Intercultural Communication
CO 212 Television Production I
CO 214 Elements of Film
CO 300 Persuasive Communication
CO 301 Communication Theory and Research
CO 302 Social Impact of Media
CO 306 Public Relations Systems and Practices
CO 308 Broadcast Journalism
CO 309 Public Relations Writing
CO 420 Communication and the Law
CO 500 Seminar in Communication Studies
J 201 News Writing and Reporting
J 311 Copy Desk

Plus four communication electives

B.S., Communication

The university also offers a B.S. in communication through the School of Business.

Communication Certificates

The communication department offers certificates in journalism and mass communication. Students may choose to take these courses on a matriculated or nonmatriculated basis. For those students who choose the nonmatriculated option, it is not necessary to apply to a degree program at the university. However, the credits earned may be applied toward the requirements for a degree program at a later date.

Journalism Certificate

The program is designed to provide basic journalism skills in both print and broadcast media. This certificate may supplement students' experience or prepare them for other areas in their current field of work. All students are required to take 15 credit hours, including the courses listed below:

Required Courses

CO 102 Writing for the Media
CO 309 Public Relations Writing
J 201 News Writing and Reporting

Plus two courses from among the following:

CO 302 Social Impact of Media
CO 308 Broadcast Journalism
J 202 Advanced News Writing and Reporting
J 311 Copy Desk
J 351 Journalistic Performance
J 367 Interpretive and Editorial Writing

Mass Communication Certificate

For information on the mass communication certificate, see the School of Business section of the catalog.

Department of Dental Hygiene

Acting Director: Sandra D'Amato-Palumbo, M.P.S., R.D.H.

Assistant Professors: Sandra D'Amato-Palumbo, M.P.S., Quinnipiac College, R.D.H.; Mark Kacerik, M.S., University of Bridgeport, R.D.H.; Renee Prajer, M.S., University of Bridgeport, R.D.H.

The cornerstone of the UNH dental hygiene program is the bachelor of science degree program. This program enables the student to be involved in dental hygiene coursework throughout all four years of the curriculum. The course of study integrates science prerequisites and general (core) education requirements with foundation and advanced-level dental hygiene courses. Graduates of the bachelor of science program will be prepared not only to seek employment in private dental offices, but also to pursue employment in a variety of other health care settings such as dental hygiene and dental business/ industry, nursing homes, centers for the developmentally disabled, hospitals, home health care agencies, correctional facilities and community health centers. Bachelor of science degree students also have the knowledge and skills necessary to pursue education at the graduate level.

Students who wish to exit the program at the end of three years of study may earn an associate in science degree in dental hygiene. This program prepares graduates for necessary board examinations and employment primarily in the dental office setting. The associate's degree program integrates science prerequisite courses and foundation dental hygiene courses into a three-year curriculum. Graduates of the program are positioned to practice as dental hygienists, and, if desired, complete the bachelor's degree by participating in one additional year of study.

In addition to the programs described above, UNH offers a dental hygiene degree completion program. This curriculum is designed for practicing dental hygienists who are graduates of associate degree programs. The degree completion program is designed to enable the dental hygienist to transfer credits from an accredited dental hygiene program and utilize their academic and work experience as the basis for completing coursework leading to the bachelor of science degree.

Admission Requirements

In addition to the general admission requirements for all prospective UNH students, it is recommended that applicants to the dental hygiene program demonstrate satisfactory performance in the sciences and mathematics. It is strongly recommended that applicants have completed both high school biology and chemistry with laboratory and two years of college preparatory mathematics. An in-person or telephone interview with the department director or a faculty member is recommended; letters of recommendation supporting the student's ability to pursue a rigorous science-based curriculum and desire to contribute in the health care delivery system are strongly encouraged. Admission to the program is limited, and part-time study is available only during the first year of the curriculum. All students enrolled in the dental hygiene clinical course sequence must be full-time students.

Professional Accreditation and Licensure

The program in dental hygiene is accredited by the Commission on Dental Accreditation of the American Dental Association, a specialized accrediting body recognized by the Commission on Recognition of Postsecondary Accreditation and by the United States Department of Education.

Students in the program are provided with application materials for the Dental Hygiene National Board Examination (written) and the Northeast Regional Board Examination (NERB/Clinical). Both the National Board Examination and a clinical examination are required for program graduates to apply for dental hygiene licensure in Connecticut and most other states.

B.S., Dental Hygiene

Students earning a bachelor of science degree in dental hygiene must complete 129-131credit hours. The courses must include the university's core requirements for bachelor degree students and the required courses listed below. Once students are enrolled in the dental hygiene clinical course sequence (DH 220, 240, 330, 350, 460), they must be enrolled in a full-time course of study.

Required Courses

DH	105-110	Introduction to Dental Hygiene I and II
CH	105	Introduction to General and Organic Chemistry with Laboratory
P	111	Introduction to Psychology
SO	113	Sociology
BI	115	Nutrition and Dietetics
BI	121	General and Human Biology with Laboratory I
DH	214	Oral Facial Structures
DH	215	Radiology
DH	220	Dental Hygiene Concepts I
E	230	Public Speaking and Group Discussion, or CO 100 Human Communication
DH	240	Dental Hygiene Concepts II
BI	261	Introduction to Biochemistry
BI	301	Microbiology with Laboratory
BI	309-310	Vertebrate Anatomy and Physiology I and II with Laboratory
PA	308	Health Care Delivery Systems
DH	320	Pharmacology and Pain Management
DH	325	General and Oral Pathology
DH	327	Periodontology
DH	330	Dental Hygiene Concepts III
DH	342	Dental Materials
DH	350	Dental Hygiene Concepts IV
DH	423	Instructional Planning and Media
DH	438	Dental Hygiene Research
DH	455	Dental Hygiene Public Health
DH	460	Advanced Dental Hygiene Practice
DH	461	Oral Medicine
DH	462	Dental Hygiene Internship
DH	468	Dental Hygiene Senior Project
DH	490-499	Special Topics

Plus two three-credit electives

A.S., Dental Hygiene

Students earning an associate in science degree in dental hygiene must complete 99-101 credit hours. The courses must include the university's core requirements for associate's degree students and the required courses listed below. Students enrolled in the dental

hygiene clinical course sequence (DH 220, 240, 330, 350, 460), must be enrolled in a full-time course of study. Those students who plan to earn an associate's degree after three years of study must enroll in one clinical course during a designated summer session.

Required Courses

DH	105-110	Introduction to Dental Hygiene I and II
CH	105	Introduction to General and Organic Chemistry
P	111	Introduction to Psychology
SO	113	Sociology
BI	115	Nutrition and Dietetics
BI	121	General and Human Biology with Laboratory I
DH	214	Oral Facial Structures
DH	215	Radiology
DH	220	Dental Hygiene Concepts I
E	230	Public Speaking and Group Discussion, or CO 100 Human Communication
DH	240	Dental Hygiene Concepts II
BI	261	Introduction to Biochemistry
BI	301	Microbiology with Laboratory
BI	309-310	Vertebrate Anatomy and Physiology I and II with Laboratory
DH	320	Pharmacology and Pain Management
DH	325	General and Oral Pathology
DH	327	Periodontology
DH	330	Dental Hygiene Concepts III
DH	342	Dental Materials
DH	350	Dental Hygiene Concepts IV
DH	455	Dental Hygiene Public Health
DH	460	Advanced Dental Hygiene Practice
DH	490-499	Special Topics

Department of Economics

The department of economics resides in the School of Business. Please see the departmental listing in the School of Business section of the catalog for information, including a list of faculty members and details on degree programs offered by the department.

Minor in Economics

A total of 18 credit hours of work in economics is required for the minor in economics.

Recommended Courses

EC	133-134	Principles of Economics I and II
EC	340	Microeconomic Analysis
EC	341	Macroeconomic Analysis

Plus 9 credits of advanced economics courses.

Department of Education

Chair: Shirley Wakin, Ph.D., University of Massachusetts

Many UNH undergraduates enter the Education Department's master's degree program after graduation. This graduate program, which often includes a supervised internship, offers three certification tracks: (1) elementary education; (2) middle school education for the fields of language arts, mathematics, social studies and science; and (3) secondary education for the fields of language arts, mathematics, social sciences, biology, chemistry, physics, earth science and business.

For students who are interested in a teaching career, preparation should start as an undergraduate. A core of 39 credits in liberal arts and sciences is required as well as 39 credits in an academic major. In addition, a student must have an undergraduate cumulative grade point average of 2.70 or higher and must successfully pass the state-mandated Praxis I examination.

Faculty in the Department of Education will be happy to advise and assist any undergraduate student who needs information about a teaching career and/or teacher certification. See the university's

Graduate Catalog for a more detailed program description.

Department of English

Chair: Donald M. Smith, Ph.D.

Director of Freshman English: Richard J. Farrell, M. Phil.

Professors Emeritii: Paul Marx, Ph.D., New York University; Douglas Robillard, Ph.D., Wayne State University

Professors: Srilekha Bell, Ph.D., University of Wisconsin; David E.E. Sloane, PhD., Duke University; Donald M. Smith, Ph.D., New York University

Associate Professor: Shakuntala Jayaswal, Ph.D., University of Wisconsin

Lecturers: Wesley J. Davis, M.A., Southern Connecticut State University; Richard J. Farrell, M.Phil., Yale University; Marianna M. Vieira, M.S., University of Bridgeport, M.A., State University of New York at Albany

An English major may choose the concentration in either literature or writing. Students in the literature concentration develop their analytic skills and critical ability by reading widely varied works in the English language, from those of William Shakespeare to Walt Whitman, Jane Austen to Gwendolyn Brooks. The study of English and American literature provides a depth and breadth of liberal education as it also improves one's thinking, writing and speaking. A major in literature is looked upon very favorably by admissions officers of law, medical and dental schools. It is good preparation for graduate work in such fields as business, education, urban planning, social work and public health. Employers in many areas of business, industry and government seek college graduates with broad knowledge and the ability to communicate effectively.

In the writing concentration, students practice a variety of written language from the expository essay to business and technological applications to more creative forms. Some specific areas in which writing skills have immediate practical worth are journalism, advertising, public relations, sales training or promotion. Many companies hire writers and editors for company periodicals and reports, equipment handbooks and service manuals. Publishing houses provide employment, of many kinds and on many levels, for persons skilled in writing. For writers of proven ability, there are numerous opportunities to freelance for trade journals, newspapers, magazines and other publications. An English major may also prepare for teacher certification at the elementary or secondary level.

Foreign Language Study

While study of a foreign language is not required, it is strongly recommended that the student who majors in English know at least one foreign language. Knowledge of a foreign language makes one more sensitive to the use and meaning of words in one's own language. Furthermore, knowledge of a foreign language widens one's perspective and deepens one's understanding through the insights gained into another culture. Students who are considering graduate study certainly should be competent in at least one foreign language.

The Literary Club

The English Department sponsors the university's Literary Club, which is open to all UNH students. Its aim is to further interest in the literary arts. It provides opportunities for students to attend readings and meet informally with established essayists, fiction writers and poets. The club also sponsors excursions to Long Wharf and the Yale Repertory theaters. The club's primary activity is publishing *The Elm City Review,* a journal of students' art and writing.

Transfer Credit for Writing Courses

The English department automatically will award credit for freshman writing courses taken at an accredited American college or university if the courses are essentially the same as E 105 or E 110 and if the student received at least a "C." If the courses were taken at a foreign college, the student will have to demonstrate his or her proficiency in writing before credit will be awarded. In the latter case, the

student should make an appointment with the secretary of the English department for the writing of a one-hour composition.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program," which appears earlier in the catalog, or contact the Co-op coordinator for the College of Arts and Sciences.

B.A., English

Thirty credit hours in English beyond the freshman level, with the restrictions indicated below, are required for a major in English. All English majors must take the following courses:

E 211 Early British Writers
E 212 Modern British Writers
E 213 Early American Writers
E 214 Modern American Writers

Concentration in Literature

The literature concentration requires any six additional literature courses.

Concentration in Writing

The writing concentration requires the following courses:

E 220 Writing for Business and Industry
E 225 Technical Writing and Presentation
E 250 Expository Writing
E 261 The Essay
E 267-268 Creative Writing I and II
E 480 Internship (may be substituted for one of the writing courses)

Teaching Language Arts

Students interested in earning a teaching certificate in middle school or secondary education in language arts may enter the graduate program at UNH. The B.A. in English is the best choice for a major, but other majors are also acceptable. Please contact the education department for additional information.

Minor in English

A total of 18 credit hours in literature and/or writing courses selected by the student in consultation with an English Department adviser.

Minor in Black Studies

The minor in Black Studies is an interdisciplinary program offered in the College of Arts and Sciences and housed in the Department of English. The minor consists of courses in English, history, political science, sociology and world music. A student may minor in this program by completing 18 credit hours of courses selected from the following list:

E 217 African-American Literature (to 1940)
E 481 Studies in Literature: African-American Literature Since 1940
HS 120 History of Blacks in the United States
MU 112 Introduction to World Music
MU 550 Studies in Urban Ethnic Music
PS 205 The Politics of the Black Movement in America
SO 221 Cultural Anthropology
SO 315 Social Change
SO 400 Minority Group Relations

Additional information is available from Dr. Donald M. Smith, chair of the English Department.

Department of History

Chair: Thomas Katsaros, Ph.D.

Professors: Joseph B. Chepaitis, Ph.D., Georgetown University; Robert Glen, Ph.D., University of California, Berkeley; Thomas Katsaros, Ph.D. New York University

Associate Professor: Edmund N. Todd, Ph.D., University of Pennsylvania

History provides a framework for a liberal educa-

tion. The study of human experience–failures as well as achievements–is the core of historical study. It gives insight into related disciplines in the humanities and social sciences and broadens the perspective of students in professional fields of business and engineering by revealing the complexity and interrelatedness of human experience.

History is also excellent preparation for a variety of careers in business, government, law, journalism, foreign service and many other areas. Because of the great variety of professional programs at the University of New Haven, the student interested in history can combine this interest with highly technical professional training.

The department strives to meet its objectives by teaching not only content but critical and writing skills through reading, class presentations and discussion, research and writing. Historical methodology is stressed in all advanced courses, and students take the history seminar in their senior year to sharpen their critical and analytic skills.

Phi Alpha Theta

The University of New Haven has a chapter of the international honor society in history, Phi Alpha Theta, which is open to those students who have had 12 hours of history or more and have maintained an average of better than 3.0 in history courses and better than 2.90 overall. The university chapter of Phi Alpha Theta provides the students and faculty with a social and intellectual experience beyond classroom work, offering films, speakers and roundtable discussions. Students not eligible for membership in the society are welcome to participate in all of the chapter's activities.

B.A., History

All students in the B.A. in history program must complete 121 credit hours. These courses must include the university core requirements and 36 credit hours of history courses, including those listed below. The balance of the program can be arranged in consultation with an adviser.

Required Courses

HS 101 Foundations of the Western World
HS 102 The Western World in Modern Times

Plus either HS 211 United States History to 1865 and HS 212 United States History Since 1865, *or* HS 110 American History Since 1607 and any other United States history course excluding HS 211/212

HS 260 Modern Asia
HS 491 Senior Seminar

Plus one upper-division Asian history elective, two upper-division courses in European history and one upper division course in American history.

Plus two electives in history.

Minor in History

A total of 18 credit hours in history is required for a minor in history. These courses must include the two courses listed below and may include any other combination of four courses in history that supports the student's interests and needs.

Required Courses

HS 101 Foundations of the Western World
HS 102 The Western World in Modern Times

Department of Mathematics

Chair: W. Thurmon Whitley, Ph.D.

Coordinator of Pre-Calculus Mathematics: Ali A. Jafarian, Ph.D.

Professors Emeriti: Joseph M. Gangler, Ph.D., Columbia University; Bertram Ross, Ph.D., New York University (*awarded posthumously*); Bruce Tyndall, M.S., University of Iowa

Professors: Ali A. Jafarian, Ph.D., University of Toronto; Erik Rosenthal, Ph.D., University of California, Berkeley; Baldev K. Sachdeva, Ph.D., Pennsylvania State University; Ramesh Sharma, Ph.D., Banaras Hindu University, Ph.D., University of Windsor; James W. Uebelacker, Ph.D., Syracuse University; Shirley Wakin,

Ph.D., University of Massachusetts; W. Thurmon Whitley, Ph.D., Virginia Polytechnic Institute and State University.

The study of mathematics opens the door to a wide variety of career opportunities and academic pursuits. Mathematics is a major part of the framework of modern science and technology Persons with strong mathematics backgrounds qualify for stimulating occupations in an ever-increasing number of fields, from private industry to government service.

The mathematics department offers a B.A. in mathematics. In addition, concentrations in computer science, statistics or natural sciences leading to a B.S. degree are offered. Students who do not take the computer science concentration are encouraged to consider a minor in computer science to be better prepared for our technological society. Students majoring in other fields may minor in mathematics.

Mathematics students have direct access to university computing facilities via computer laboratories throughout the campus. Several modern computing languages are available. The most modern and up-to-date data processing packages as well as mathematical and statistical software packages have been installed and are utilized in instruction.

Student Awards

Each year, the mathematics department awards to outstanding mathematics students free honorary memberships in the Mathematical Association of America and the Society for Industrial and Applied Mathematics.

In addition, the department annually awards the Bert Ross Mathematics Prize to the outstanding senior mathematics major. This award consists of a set of mathematics books and a certificate of achievement.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the College of Arts and Sciences.

Basic Courses Required for All Mathematics Majors

All students earning a bachelor's degree in mathematics must complete the university core requirements, the course requirements for their particular math program, and the basic math courses listed below:

M	117-118	Calculus I and II
M	203	Calculus III
M	204	Differential Equations
M	305	Discrete Structures
M	308	Introduction to Real Analysis
M	311	Linear Algebra
M	321	Modern Algebra
M	331	Combinatorics, *or*
M	361	Mathematical Modeling
M	338	Numerical Analysis
M	371	Probability and Statistics I
M	472	Probability and Statistics II
M	491	Department Seminar

B.A., Mathematics

This program is designed to provide students with a broad overview of mathematics and its applications, especially for students who wish to study pure mathematics, or for those whose career objectives include mathematics education or the application of mathematics to such fields as business, economics or the social sciences.

Students earning a B.A. with a mathematics major must complete a minimum 125 credit hours. These courses must include the basic courses required for all mathematics majors, which are listed above, the university core requirements listed earlier in this catalog, and the courses listed below:

Required Courses

CS	110	Introduction to C Programming I
CS	112	Introduction to C Programming II
CS	226	Data Structures and Algorithms I
PH	150	Mechanics, Heat and Waves with Laboratory

Plus 6 credit hours of mathematics, compatible with area of concentration, M 300 series or above.

Teaching Mathematics

Students interested in earning a teaching certificate in middle school or secondary education in mathematics may enter the graduate program at UNH. The B.A. in mathematics is the best choice for a major, but other majors are also acceptable. Please contact the education department for additional information.

B.S., Mathematics

Students interested in applied mathematics should pursue the B.S. degree. Within this degree program, the concentrations of computer science, natural sciences and statistics are offered.

Students earning a B.S. with a major in mathematics must complete a minimum of 125 credit hours. These courses must include the basic courses required for all mathematics majors listed above, the university core requirements listed earlier in the catalog, and the courses listed below for one of the three concentrations.

Concentration in Computer Science

This program is primarily for students interested in using computing techniques to solve mathematical problems in a wide variety of disciplines. In addition to the mathematics requirements, students take eight or nine courses in computer science designed to provide training in the structure of computer languages, computing machines and computing systems.

Students in this program must complete a minimum of 125 credit hours. These courses must include the basic courses required for all mathematics majors, which are listed above, the university core requirements listed earlier in this catalog, and the courses listed below:

Required Courses

CS 110 Introduction to C Programming I
CS 112 Introduction to C Programming II
CS 226 Data Structures and Algorithms I
CS 326 Data Structures and Algorithms II
CS 310 Computing Theory
PH 150 Mechanics, Heat and Waves with Laboratory

Plus 9 credit hours in computer science; 9 credit hours in mathematics, chemistry or physics.

Concentration in Natural Sciences

This program is primarily for students whose mathematical interests are in the application of mathematics to such fields as physics, chemistry, operations research and engineering. In addition to the courses listed below, the students take five to seven courses in a single discipline of the natural sciences or engineering.

Students in this program must complete a minimum of 127 credit hours. These courses must include the basic courses required for all mathematics majors, which are listed above, the university core requirements listed earlier in this catalog, and the courses listed below:

Required Courses

CS 110 Introduction to C Programming I
CS 112 Introduction to C Programming II
CS 226 Data Structures and Algorithms I
PH 50 Mechanics, Heat and Waves with Laboratory
PH 205 Electromagnetism and Optics with Laboratory
CH 115/CH 117 General Chemistry I and Laboratory

Plus 6 credit hours of mathematics, compatible with area of concentration, M 300 series or above.

Concentration in Statistics

This program is designed to provide students with a background in mathematical statistics. The mathematics courses required are basic courses necessary to enable a person to gain employment as a statistician in business or government, or to pursue graduate study in statistics. These courses are also necessary for students wishing to pursue careers in the actuarial field.

Students in this program must complete a minimum of 125 credit hours. These courses include the basic courses required for all mathematics courses which are listed above, the university core requirements listed earlier in the catalog, and the courses listed below:

Required Courses

M 473 Advanced Statistical Inference
M 481-482 Linear Models I and II
CS 110 Introduction to C Programming I
CS 112 Introduction to C Programming II
CS 226 Data Structures and Algorithms I
PH 150 Mechanics, Heat and Waves with Laboratory

Plus 12 credit hours in science, computer science or mathematics.

Minor in Mathematics

Students may minor in mathematics by completing six mathematics courses approved by the department. Those students contemplating a minor in mathematics should consult with the department as early as possible in their academic careers as to the choice and availability of courses.

Required Courses

M 118 Calculus II
M 203 Calculus III
M 311 Linear Algebra

Plus 9 credit hours of mathematics courses which complement the major area of interest.

Recommended Courses

M 204 Differential Equations

Any course in the M 300 series or above.

Department of Physics

Assistant Professor: Matthew Griffiths, Ph.D., University of Edinburgh

Physics is concerned with the most basic aspects of our knowledge of the natural world. It is a subject in which experiment and theory evolve constantly to provide a precise and simple description of the physical phenomena around us in terms of a relatively small number of physical laws and theories.

As a fundamental science, physics is at the root of almost all branches of science and technology. It has provided the microscopic basis for chemistry, has stimulated important developments in mathematics, is the basis of most branches of engineering and, during the past decade, has proved to be increasingly valuable to the life sciences.

Consequently, a basic knowledge of physics is excellent preparation for diverse careers: research in university and government laboratories, industrial research and development, applied science and engineering, biological and medical sciences, research in environmental problems, and teaching at all levels from the elementary school to the university. It also prepares students for careers in non-physics-related fields such as philosophy, business and law.

The university does not currently offer a bachelor's degree program in physics. The department does, however, offer a minor in physics suitable for majors in any of the university's schools and departments. A physics minor is particularly valuable for students in chemistry, environmental science, biology, forensic science, fire science or occupational safety as well as for any student planning to teach any science at the elementary or secondary level. A special physics minor concentration is available for students interested in careers in journalism, public management or public policy areas.

The physics minor requires a total of 20 credit hours of work in physics. Students should plan their minor in consultation with a faculty adviser in the physics department.

Required Courses

PH 150 Mechanics, Heat and Waves with Laboratory
PH 205 Electromagnetism and Optics with Laboratory
PH 211 Modern Physics

Plus 9 credit hours of selected physics courses depending on the career interests of the student.

Department of Political Science

Chair: Natalie J. Ferringer, Ph.D.

Professors: Lawrence J. DeNardis, Ph.D., New York University; Caroline A. Dinegar, Ph.D., Columbia University; James L. Dull, Ph.D., Columbia University; Natalie J. Ferringer, Ph.D., University of Virginia; Joshua H. Sandman, Ph.D., New York University

A major in political science provides the student with a foundation for a career in government on the local, state, national and international levels; for a career in law; for graduate school programs in political science, international relations and public policy; and for careers in the areas of campaign management, communication, public relations and business. All political science and prelaw majors or minors should discuss career goals and educational objectives with a department adviser within one month of entrance into the program.

Further, advice on the Law School Admissions Test (LSAT) and the Graduate Record Examination (GRE) preparation courses, which our prelaw and graduate school-oriented students are urged to take, is available through the department.

Prelaw majors and minors in the department of political science have been especially successful in gaining entrance to law schools throughout the country.

The political science faculty grants the Rollin G. Osterweis Award for Excellence in Political Science to an outstanding political science student.

B.A., Political Science

All students in the B.A. in political science program must complete 121 credit hours. These courses must include the university core requirements and 48 credit hours of political science courses, including those listed below:

Required Courses

PS 121 American Government and Politics
PS 122 State and Local Government and Politics
PS 241 International Relations
PS 243 International Law and Organization
Plus one of PS 281, 282, 283, 285 Comparative Political Systems
Plus one of PS 304, 308, 309 Political Parties, Legislative Process, The American Presidency
PS 332 Constitutional Law
PS 461 Political Theory: Ancient and Medieval
PS 462 Political Theory: Modern and Contemporary
PS 499 Senior Seminar I
Plus 18-21 hours of political science electives to be chosen with student's department adviser.

Minor in Political Science

The department of political science offers several course clusters for students from other disciplines who wish to enhance their degree programs. The minor consists of 18 credit hours of political science courses, chosen with a department adviser. Several three-course clusters are suggested below for inclusion in the minor to address particular interests. In each case, nine additional credit hours are to be chosen in consultation with a department adviser.

American Government

PS 121 American Government and Politics
PS 122 State and Local Government and Politics
PS 332 Constitutional Law

International Relations

PS 241 International Relations
PS 243 International Law and Organization
PS 281-285 Comparative Political Systems (at least one)

In some programs, IB 312 International Business may be substituted for a political science course.

Legal Studies

PS 230 Anglo-American Jurisprudence
PS 231 Judicial Behavior
PS 332 Constitutional Law

General Political Science

Students whose needs are best served by a mixture of political science courses may construct an individualized minor in consultation with a departmental adviser.

Two additional minor clusters are offered through the Institute of Law and Public Affairs.

Paralegal Studies Certificate

A certificate in paralegal studies is issued to students who complete 18 credit hours of paralegal courses. The required courses are listed below.

Required Courses

PS 238 Legal Procedure I
PS 240 Legal Bibliography and Resources (prerequisite for PS 440)
PS 440 Legal Research

Plus 9 additional credit hours from the courses in the Institute of Law and Public Affairs. Institute courses are designated by a symbol (†) in the course descriptions section.

Certificate in Public Policy (Campaign Management)

A certificate in public policy is issued to students who complete 18 credit hours of courses in areas of public affairs designed to serve the student's intellectual and professional needs. An example is the program in campaign management.

Required Courses

PS 121 American Government and Politics

Plus five of the following:
PS 224 Public Attitudes and Public Policy
PS 340 Campaign Management: Procedures and Operations
PS 341 Campaign Management: Structure and Organization
PS 344 Campaign Management: Survey Research, Polling, Computers
PS 346 Campaign Management: Financing and Election Laws
PS 450 Campaign Management: Internship

Additional related elective courses may be selected with the approval of a departmental adviser.

Department of Psychology

Chair: Thomas L. Mentzer, Ph.D.

Professors: Robert J. Hoffnung, Ph.D., University of Cincinnati; Arnold Hyman, Ph.D., University of Cincinnati; Thomas L. Mentzer, Ph.D., Brown University; Michael Morris, Ph.D., Boston College; Michael W. York, Ph.D., University of Maryland

Associate Professors: Gordon R. Simerson, Ph.D., Wayne State University

Assistant Professor: Tara L'Heureux-Barratt, Ph.D., University of Connecticut

Psychology faces the questions that are of most immediate concern to the individual: problems such as personal identity, the social context, normalcy versus deviance and behavior change. As a science, psychology is devoted to the understanding, prediction and control of behavior.

Our dedication to these goals requires that we study behavior from a number of viewpoints–development, learning, social, physiological, abnormal personality–each fascinating in its own right. The student's attention is drawn also to the many settings in which behavior occurs, from the family to the laboratory, from the clinic to the marketplace. This great diversity ensures that the study of psychology will interrelate well with other courses in the humanities and sciences.

The undergraduate program in the department of psychology combines basic science and applications to prepare students for further professional training in psychology or for careers in human services delivery, law, education, business and industry.

The program features a specialty concentration in community-clinical psychology for those students who have well-defined professional goals. The general psychology concentration permits students to tailor their preparation toward other specialty areas. Psychology majors are encouraged to broaden their preparation by taking courses or minors in sociology, political science, social welfare, management, computer science, criminal justice, mathematics and biology.

The psychology major develops skills in design and analysis of research and effective communication through the study of statistics, experimental methods, psychological measurement and psychological theory. Through involvement with behavior therapy and community psychology field work, the student can confront behavior problems in a more direct, practical fashion. The department feels that it is only through a thorough grounding in basic skills and principles that students can effectively realize their goals.

The psychology program benefits from a psychology laboratory building on the main campus. The laboratory contains facilities for student and faculty research with human and animal subjects. Specialized apparatus permits the study of human and animal learning, sensory capacities, social processes and biofeedback control.

The University of New Haven also offers the master of arts degree in community psychology and industrial/organizational psychology as well as a graduate certificate in applications of psychology. For descriptions of these programs, see the Graduate School catalog.

Psychology Club

Students in psychology have the opportunity to participate in the Psychology Club. Its purpose is to provide opportunities both to socialize and to develop students' interests in the science and profession of psychology. Throughout the year, the club sponsors guest lecturers and a variety of field trips. All students are welcome to join.

Psi Chi Honor Society

Membership in the university chapter of Psi Chi, the national honor society, is open to students in the top 35 percent of their class who have completed at least nine credit hours of psychology with grades of B or better, and who are making the study of psychology one of their major interests.

Graduating seniors also may nominate themselves for the annually-awarded McGough psychology prize.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the College of Arts and Sciences.

B.A., Psychology

The B.A. in psychology program requires the completion of 120 credits, 43 of which are required to complete the major.

Required Courses

P 111 Introduction to Psychology
P 301 Statistics for the Behavioral Sciences
P 305 Experimental Methods in Psychology
P 306 Psychology Laboratory
P 315 Human and Animal Learning
P 341 Psychological Theory
P 361 Behavioral Neuroscience

The required courses comprise 22 credit hours of the 43 required for the major. To complete the major, students must complete 6 credit hours of psychology restricted electives and one of the two 15-credit-hour concentrations described below.

The psychology restricted electives are selected by the student in consultation with the academic adviser. Suggested electives for the community-clinical concentration are: P 316, P 321, P 331, P332, P 351, P 370.

Psychology majors are required to take a number of courses in other departments, some of which satisfy university core curriculum requirements: BI 121 and BI 122 General and Human Biology I and II; M 127 Finite Mathematics; SO 113 Sociology; one literature and one philosophy elective, one of which must be from the core curriculum approved course list.

It should be noted that M 127, P 301 and P 305 constitute a sequence of courses incorporating computer use. Those courses satisfy the core curriculum computer literacy requirement and must be taken in that order.

Concentration in Community-Clinical Psychology

P 216 Psychology of Human Development
P 330 Introduction to Community Psychology
P 336 Abnormal Psychology
P 350 Human Assessment
P 375 Foundations of Clinical/Counseling Psychology

Concentration in General Psychology

The general psychology concentration consists of 15 credit hours of psychology electives beyond the required courses.

Minor in Psychology

Psychology, perhaps more than any other subject, relates closely to many other disciplines. A minor in psychology prepares you for graduate study in the field and can add another dimension to your studies in other programs at the university. A total of six courses is required for a minor in psychology.

Required Courses

P 111 Introducrion to Psychology
P 301 Statistics for the Behavioral Sciences
P 305 Experimental Methods in Psychology

Plus 9 additional credits of psychology electives.

Exceptions to the requirements above can be made for students whose major programs contain required courses that are equivalent to P 301 and P 305 (such as CJ 251 and CJ 250.) Such students may be permitted to substitute advanced psychology courses for P 301 and P 305. Exemptions will be granted on a case by case basis by the chairperson of the Psychology Department.

Department of Sociology

Chair: Judith Bograd Gordon, Ph.D.

Professor: Allen L. Sack, Ph.D., Pennsylvania State University

Associate Professor: Judith Bograd Gordon, Ph.D., University of Michigan

Sociology is the study of social life and the social causes and consequences of human behavior. Sociology's subject matter ranges from analysis of families, corporations, cities and sports to sexuality, death, race, gender and ethnicity as well as the impact of demographic and environmental policies and other social phenomena. The sociological perspective is empirically grounded and sufficiently broad to be relevant to those considering careers in related fields such as research, govern-mental service, social work, personnel management, advertising, law, medicine, journalism, social gerontology, and hospitality and tourism.

The University of New Haven does not currently offer a major in Sociology. For those students wishing to satisfy core or elective requirements, or for students who may wish to select sociology or social welfare as a minor, a selection of courses is offered.

Department of Visual and Performing Arts and Philosophy

Chair: Michael G. Kaloyanides, Ph.D.

Professor Emeritus: Elizabeth J. Moffitt, M.A., Hunter College

Professors: Ralf E. Carriuolo, Ph.D., Wesleyan University; Michael G. Kaloyanides, Ph.D., Wesleyan University; Joel H. Marks, Ph.D., University of Connecticut

Associate Professor: Guillermo E. Mager, Ph.D., New York University

Assistant Professors: Albert G. Celotto, M.M., Indiana University; Robert J. Rafalko, Ph.D., Temple University; Christy A. Somerville, M.A., California State University—Long Beach

Artist-in-Residence: James Sinclair, M.A., University of Hawaii, Music Director of Orchestra New England

Visual Arts

Study of the visual arts provides an opportunity for self-realization and gives the individual a perception of his relationship to society. Foundation courses in the basics of two- and three-dimensional design, color and drawing, plus work in such major disciplines as painting, sculpture and the use of computers as a design tool, provide the student with the necessary vocabulary for effective visual communication.

Knowledge of the development of art throughout human cultural evolution from the cave era to present day is provided through studies in art history and the contemporary art scene. Thus, equipped with a working vocabulary of visual form and a sense of art history, students progress toward the goal of making a mature visual statement in their chosen fields.

University of New Haven art programs provide preparation for graduate study or career opportunities in fields related to art, graphic design, interior design and architecture.

Students in all B.A. art programs listed below must complete at least 121 credit hours. These courses must include the core requirements for the university and the required courses as listed for each program.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the College of Arts and Sciences.

Basic Courses Required for Art Majors, B.A.

AT 105-106	Basic Drawing I and II
AT 201	Painting I
AT 211-212	Basic Design I and II
AT 213	Color
AT 231-232	History of Art I and II
AT 401-402	Studio Seminar I and II

Basic Courses Required for Art Majors, A.S.

AT 211-212	Basic Design I and II
AT 213	Color

B.A., Art

This program is designed to assist students in discovering their potential for creative expression in the plastic arts and the development of a personal idiom in the disciplines of their own choosing including painting, sculpture, drawing, printmaking, etc. Acquisition of an effective visual vocabulary is promoted by foundation courses in two- and three-dimensional design, color and drawing. Art historical studies provide perspective on the art forms of the past.

The program prepares students for graduate study in art as well as for career opportunities in a broad spectrum of art and art-related fields.

Required Courses

Basic courses required for art majors, B.A., and the following:

AT 101-102	Introduction to Studio Art I and II
AT 202	Painting II
AT 205	Ceramics I
AT 209	Photography I
AT 302	Figure Drawing
AT 304-305	Sculpture I and II
AT 315	Printmaking

Plus one art history elective and two art electives.

B.A., Graphic Design

Graphic design, the art of visual communication through words and pictures, is an expanding discipline in current society. Posters, publications, identity systems, graphs, diagrams, information design, signage and exhibits are components of the visual environment in which we live. The graphic designer's duty is to bring clarity and visual aesthetics to communication through an understanding of theory, design practice and technology.

The introductory courses in the graphic design program concentrate on basic design vocabulary, composition, color perception, drawing, introduction to the

use of computers as a design tool and photography. The junior and senior year education focuses on typographic studies, illustration, critical analysis, problem-solving methodology, advanced computer projects and complex applied design projects, preparing the students for entry-level graphic design positions in design studios, corporations and agencies, as well as for graduate studies in the field.

Required Courses

Basic courses required for art majors, B.A., and the following:

AT 122	Graphic Design Production
AT 203-204	Graphic Design I and II
AT 209	Photography I
AT 221-222	Typography I and II
AT 309	Photographic Design
AT 315	Printmaking
AT 322	Illustration
AT 401-402	Studio Seminar I and II
AT 403-412	Selected Topics (one course)
AT 599	Independent Study (Graphic Design)
MK 307	Advertising and Promotion

Plus a course in computer design and a senior project.

B.A., Interior Design

Studies in the interior design programs are organized to focus on the technology of a built environment, programming and three-dimensional composition. Students explore the relationship between interior designers and their clients, the interaction between designers and architects, and methods of communication between designers and fabricators. In addition to interior design problems, students are given the opportunity to develop their studio art skills, CAD and other computer skills, and their presentation techniques. Core coursework includes architectural drawing, building construction, color theory, history of interior design and texrile design.

Required Courses

Basic courses required for art majors, B.A., and the following:

AT 216	Architectural Drawing
AT 233	History of Architecture and Interior Design
AT 302	Figure Drawing
AT 304	Sculpture I
AT 317	Interior Design
AT 322	Illustration
AT 331	Contemporary Art
AT 401-402	Studio Seminar I and II
CE 302	Building Construction

Plus courses in computer architectural drawing and architectural presentation techniques, topics in business practices, interior products and specifications, interior perspective and rendering techniques, lighting design, internship, independent study, etc., and a senior project.

Recommended Electives

AT 203	Graphic Design I
AT 309	Photographic Design
MM 301	Introduction to Multimedia

Concentration in Interior Design/Prearchitecture

The prearchitecture concentration provides a thorough preparation for students planning to enter a professional degree program at the graduate school level. It also provides architecturally oriented training for those who might wish to seek employment in this and related areas such as city planning or landscape design. Liberal arts, technological studies and studio arts are carefully integrated into a balanced curriculum. Students gain insight into the relationship between architects and clients, investigate the nature of building and develop skills in presentation methods.

Coursework includes the history of architecture, architectural drawing, building construction, appropriate civil engineering studies, CAD and other computer skills, and studio art courses in color and design.

Required Courses

Basic courses required for art majors, B.A.., and the following:

AT 216 Architectural Drawing
AT 233 History of Architecture and Interior Design
AT 302 Figure Drawing
AT 304 Sculpture I
AT 317 Interior Design
AT 322 Illustration
AT 331 Contemporary Art
AT 401-402 Studio Seminar I and II
CE 302 Building Construction
CE 403 City Planning
M 115 Pre-Calculus
M 117 Calculus I
PH 100 Introductory Physics with Laboratory

Plus courses in architectural drawing and architectural presentation techniques, CAD (computer-aided design) drawing , topics in business practices, lighting design, internship, independent study, etc., and a senior project.

A.S., Graphic Design

Required Courses

Basic courses required for art majors, A.S., and the following:

AT 122 Graphic Design Production
AT 203 Graphic Design I
AT 209 Photography I
AT 221-222 Typography I and II
AT 309 Photographic Design

Plus the university's associate's degree core.

A.S., Interior Design

Required Courses

Basic courses required for art majors, A.S., and the following:

AT 216 Architectural Drawing
AT 233 History of Architecture and Interior Design
AT 302 Figure Drawing
AT 304 Sculpture I
AT 317 Interior Design
AT 322 Illustration
AT 331 Contemporary Art
CE 302 Building Construction

Plus the university's associate's degree core.

Minor in Art

A total of 18 credit hours of work in art is required for the minor in art. Students may take the courses listed below and any other combination of courses that fills their needs and interests.

Recommended Courses

AT 201 Painting I
AT 211 Basic Design I, or AT 212 Basic Design II
AT 213 Color
AT 231-232 History of Art I and II
AT 304 Sculpture I, *or* AT 305 Sculpture II

Art Certificates

The art department offers certificates in graphic design and interior design. Students must complete 15 credit hours of required courses to earn a certificate. Students may choose to take these courses on a matriculated or nonmatriculated basis. For those students who choose the nonmatriculated option, it is not necessary to apply for admission to a degree program at the university. However, the credits earned may be applied toward the requirements for a degree program at a later date.

Graphic Design Certificate

This certificate is designed for individuals employed in advertising, printing, photography, public relations and marketing as well as architects and those interested in entering the field of graphic design. Designed to broaden and update commercial art skills, the certificate courses emphasize layout, design and the principles of effective design communication. All students are required to take 18 credit hours, chosen from the seven courses listed below:

Required Courses (Choose 6)

AT 105 Basic Drawing I
AT 122 Graphic Design Production

AT 203-204 Graphic Design I and II
AT 211 BasicDesign I
AT 221-222 Typography I and II

Interior Design Certificate

This certificate was developed for individuals seeking a professional knowledge of design and decorating skills applicable to both home and office decoration. All students are required to take 15 credit hours, chosen fromthe eight courses listed below:

Required Courses (Choose 5)

AT 105 Basic Drawing I
AT 211-212 Basic Design I and II
AT 213 Color
AT 216 Architectural Drawing
AT 233 History of Architecture and Interior Design
AT 317 Interior Design
CE 302 Building Construction

Multimedia Studies

Coordinator: Guillermo E. Mager, Ph.D.

Multimedia is the use of computers for the integration of graphics, animation, video, music, speech and live presentation. Active markets for multimedia include (1) the Internet, where careers in web page creation and web site management have grown exponentially in recent years; (2) business, where computer presentations have taken the place of slide shows; (3) education, where teachers and parents are finding new ways to present their material; and (4) the entertainment industry, with the ever-growing use of computers for special effects in games, music videos and films.

Multimedia studies will enable graduates from programs in graphic design, music, education, business and many other disciplines to use the computer not only to generate traditional print materials but also to design interactive programs for use in web sites on the Internet, CD-ROMs, business presentations, games and educational software.

The multimedia courses and the web page creation courses have been designed to allow students to use computer, audio, video and graphic technologies to conceptualize and implement interactive interfaces in a comprehensive approach that includes the multimedia production process, the technology and the aesthetic design.

Minor in Multimedia Authoring

A total of seven courses (21 credits) are required to complete the minor in multimedia authoring.

Required courses (9 credits):

MM 301 Introduction to Mulrimedia
MM 311 Advanced Multimedia
MM 401 Multimedia Seminar

Plus **two of the following sequences (12 credits)**:**

MU 311-312 Multitrack Recording I and II
AT 203-204 Graphic Design I and II
CO 212-312 Television Production I and II

** These courses must be taken outside the student's major area of study (for example, music majors may not use MU 311-312). Also, note that some of these courses have prerequisites.

Theatre Arts

Theatre courses may be used to satisfy the arts core requirements. Refer to the latest class schedule bulletin to determine the specific courses permitted.

Productions

The university community may take part in all department productions. Volunteers may act in productions as well as help with lighting, set and costume design, set construction, publicity and stage management. Participants need not be enrolled in theatre classes.

Minor in Theatre Arts

Students may complete a minor in theatre arts by taking 18 credit hours in the theatre program. Three

major productions are mounted each year by the department, with opportunities for students in performance, directing and backstage work.

Required Courses

T 131 Introduction to the Theatre
T 132 Theatrical Style
T 241 Early World Drama and Theatre
T 242 Modern World Drama and Theatre

Plus 6 additional credit hours in theatre arts, chosen from: T 341 Acting, T 342 Play Directing, T 491 Production Practicum I, T 492 Production Practicum II, T 599 Independent Study.

Music

Coordinator: Michael G. Kaloyanides, Ph.D.

Music courses may be used to satisfy the art core requirements.

The program in music is unique. Music is studied as a world-wide phenomenon, not simply defined in the western European art tradition. Students are encouraged to view music as a creation of all cultures and civilizations on both the folk and art levels, including our own urban and ethnic subcultures. Exposure to various music should lead students to specialization in a particular area as upperclasspersons.

Since music is a performing art, students are expected to reach a satisfactory level of proficiency in either a traditional western instrument or one central to the particular culture in which they choose to specialize.

A degree in music qualifies students for professions as performers, composers, music publishers, critics and journalists, teachers, curators and librarians. Combining music with other fields, graduates may enter the fields of concert and ensemble management and sound engineering areas. There are, of course, countless performance opportunities for instrumentalists, vocalists and composers. Vocations such as music publishing, recording sales and promotions, and music criticism and journalism are also available to graduates with a degree in music. Students may also pursue careers in music education, not only as teachers in schools and conservatories but also as curators and librarians.

Performance/Practice and Recording Facilities

In addition to traditional performance and practice rooms, the following special areas have been equipped for the use of students enrolled in the music industry and sound recording programs.

Studio A

The advanced recording technology classes take place in our largest recording facility, which was designed to excel as both a teaching and professional recording environment. The control room design offers comfortable seating for the students as well as providing an excellent view of the console and the rest of the equipment. Equipment includes a 24-track analog and two 8-track digital recorders for a total of 40 tracks; a 40-input/32 monitor console for a total of 72 inputs in mix mode; a Windows computer with a digital audio card, MIDI interface and CD recording capabilities; an extensive selection of outboard (signal processing) equipment; and MIDI gear, including synthesizer, drum machine and a sampler.

Studio B

Multitrack recording and MIDI classes take place in a second recording facility with a 16-input/16 monitor console, a digital multitrack recorder, a computer with digital audio and MIDI sequencing capabilities , assorted signal processing equipment, and MIDI synthesizer and drum machine.

Studio C

Our new digital mixing facility contains two digital multitrack recorders, a digital mixing board, a computer with digital audio and CD recording capabilities, signal processing gear and a DAT tape machine.

Workstations

Smaller recording/mixing stations include 4-track tape

recorders/mixers, synthesizers and outboard (signal processing) equipment.

B.A., Music

The bachelor of arrs in music is a dynamic program for the study of music within a liberal arts curriculum. It is distinctive in its treatment of music as a worldwide phenomenon. It is also flexible, allowing students to focus on performance or musicology.

Students focusing on performance are urged to take private instruction on an instrument or in voice each semester of enrollment. Seniors must present either a senior thesis or a senior recital to qualify for graduation. There are options in the senior year curriculum for courses appropriate for thesis or recital preparation.

All students majoring in the B.A. in music programs must complete 121-122 credit hours.

Required Courses

These courses must include the core requirements of the university plus the following music courses:

MU 111	Introduction to Music
MU 112	Introduction to World Music
MU 116	Performance (12 credit hours minimum)
MU 125/126	Elementary Music Theory with Laboratory (if required)
MU 150-151	Introduction to Music Theory I and II
MU 175-176	Musicianship I and II
MU 201-202	Analysis and History of European Art Music I and II
MU 501	Seminar in Advanced Research I, *or* MU 416 Advanced Performance
MU 502	Seminar in Advanced Research II, *or*
MU 416	Advanced Performance

Music electives (6 credit hours)

B.A., Music Industry

The music industry program is offered to anyone interested in an exciting career in the fields of music management, arts administration, record production, promotion and sales, marketing, artist management, music publishing and any other areas in the entertainment industry.

The program provides a unique balance of courses in the areas of music, sound recording and business as well as music industry. The music courses include such topics as music theory, musicianship, music history and performance. The sound recording courses include multitrack recording, digital audio and the use of computers in the recording studio. The business courses cover areas such as accounting, management and marketing.

The music industry courses, specifically designed for this program, cover topics such as record companies, contracts, music marketing and merchandising, recording studio management, music publishing, copyright law and concert planning, promotion and management. Special emphasis will be given to career planning and development.

Required Courses

These courses must include university core requirements plus the courses listed below:

MU 125/126	Elementary Music Theory with Laboratory (if required)
MU 150-151	Introduction to Music Theory I and II

Plus the following:

MU 116	Performance
MU 175-176	Musicianship I and II, *or* MU 201-202 Analysis and History of European Art Music I and II
MU 261	Introduction to the Music Industry
MU 301	Recording Fundamentals
MU 311-312	Multitrack Recording I and II
MU 361	Production, Promotion and Distribution
MU 362	Legal Issues, Copyrights and Contracts
MU 461-462	Internship in the Music Industry I and II

Music electives (12 credits)

A 101	Introduction to Financial Accounting
A 102	Introduction to Managerial Accounting
MG 310	Management and Organization
MK 300	Principles of Marketing

Business electives (6 credits)

B.A., Music and Sound Recording

The bachelor of arts in music and sound recording is a unique four-year degree program. Its development is based on the philosophy that musicians should have a working knowledge of the media through which their art is most often heard and that sound recordists should have a working knowledge of the art form they are recording. Thus, it is designed to instruct students in three interrelated areas: 1) music history, theory and aesthetics; 2) musicianship; and 3) sound recording methodology and technique. Coursework includes 38 credits in arts and sciences, 36 credits in music, 15 credits in recording and 34 credits in restricted and free electives for a total of 123.

Required Courses

These courses must include the university core requirements plus the courses in the following list:

MU	111	Introduction to Music
MU	112	Introduction to World Music
MU	116	Performance (6 credit hours minimum)
MU	125/126	Elementary Music Theory with Laboratory (if required)
MU	150-151	Introduction to Music Theory I and II
MU	175-176	Musicianship I and II
MU	201-202	Analysis and History of European Art Music I and II
MU	211	History of Rock
MU	221	Film Music
MU	301	Recording Fundamentals
MU	311-312	Multitrack Recording I and II
MU	401-402	Recording Seminar/ Project I and II
PH	100	Introductory Physics with Laboratory
PH	203	The Physics of Music and Sound with Laboratory

B.S., Music and Sound Recording

The bachelor of science in music and sound recording is similar to the bachelor of arts program in its philosophy and design but provides a stronger background in the science and technology of recording through classes in calculus, physics and electrical engineering. Coursework includes 47 credits in arts and sciences, 36 credits in music, 15 credits in recording, six credits in electrical engineering and 19 credits in restricted and free electives for a total of 123 credits.

Required Courses

These courses must include university core requirements plus the following courses :

MU	111	Introduction to Music
MU	112	Introduction to World Music
MU	116	Performance (6 credit hours minimum)
MU	125/126	Elementary Music Theory with Laboratory (if required)
MU	150-151	Introduction to Music Theory I and II
MU	175-176	Musicianship I and II
MU	201-202	Analysis and History of European Art Music I and II
MU	211	History of Rock
MU	221	Film Music
MU	301	Recording Fundamentals
MU	311-312	Multitrack Recording I and II
MU	401-402	Recording Seminar/Project I and II
EE	211-212	Principles of Electrical Engineering I and II
M	117-118	Calculus I and II
PH	150	Mechanics, Heat, Waves with Laboratory
PH	205	Electromagnetism and Optics with Laboratory

Minor in Music

A total of 18 credit hours in music courses other than performance are required for the minor in music. A student's program should be planned in consultation with a member of the music faculty.

Philosophy

Coordinator: Joel H. Marks, Ph.D.

Philosophy looks at fundamental assumptions about the nature of reality and human existence. Are people nothing but organic robots with computer

brains? Or do we have eternal souls? Is it possible to love unselfishly? Is reason the slave of the passions? Is it better to be a human being dissatisfied than a pig satisfied? Do we have fundamental obligations to ourselves? . . . to other humans? . . . to other animals? . . . to the environment? . . . to certain principles?

Philosophy courses at UNH examine the major world traditions of thought from ancient times to the present. Emphasis is placed on ethical inquiry, including the application of ethical thinking to our daily and professional lives.

Minor in Philosophy

The minor in philosophy provides ample opportunity to consider many fascinating and important questions like the ones mentioned above. It is also very useful–philosophy has helped people prepare for careers in such diverse fields as computer systems programming, engineering, management, insurance, marketing, publishing, real estate, technical writing, government, human services, journalism, law, medicine, teaching and research.

The minor in philosophy consists of 18 credits. The program is flexible; courses run frequently, day and evening, and can be taken in any order. Also, it is usually possible for students to cap their philosophical careers at UNH with independent study which lets them concentrate on a single topic of interest and set up their own schedule. For more details, contact the philosophy coordinator.

SCHOOL OF BUSINESS

Linda R. Martin, Ph.D., dean
Zeljan E. Schuster, Ph.D., associate dean

The mission of the School of Business at the University of New Haven is to provide quality, career-oriented education to students with varied backgrounds and experiences. The School of Business will seek to accomplish this through comprehensive teaching programs and by engaging in a variety of research and consulting activities involving both the development and communication of knowledge to the academic, business and government sectors. It is the vision of the school to be the regional leader in providing career-oriented, contemporary business education.

As the business environment becomes more complex, the School of Business provides contemporary educational experiences of high quality in order to prepare students who are ready to face the challenges of a dynamic, modern world and to meet their responsibilities within a global society. To meet this goal, career-oriented programs are provided, employing current knowledge and techniques presented in a manner appropriate to the diverse backgrounds and experiences of students.

An interactive curriculum is designed to provide students with the tools to pursue a wide variety of professional, educational and intellectual activities. In addition to full-time students, many men and women who are enrolled are at the same time employed in various public and private organizations and are working toward their degrees on a part-time basis. This diversity creates a unique learning environment.

Programs

Bachelor of Science

Accounting
Business Administration
  Management of Sports Industries
Business Economics
Communication
Finance
International Business
Management of Sports Industries
Marketing

Associate in Science

Business Administration
Communication

Certificates

Journalism
Mass Communication

Graduate Programs

Doctor of Science/Management Systems (Sc.D., being phased out)

Master of Business Administration (M.B.A.)

Master of Business Administration for Executives (E.M.B.A.)

Master of Public Administration (M.P.A.)

Master of Science (M.S.)

Accounting
Finance and Financial Services
Health Care Administration
Industrial Relations
Taxation

Dual Degrees

M.B.A./M.S. Industrial Engineering
M.B.A./M.P.A.

Graduate Certificates

(See Graduate Catalog)

General Policies in the School of Business

- Each student will be assigned an academic adviser.
- A student may select a business major after consultation with the appropriate adviser.

- A student may select a minor after consultation with the adviser or the appropriate chair.
- No coordinated course credit or transfer credit will be accepted from two-year colleges for UNH juniors or seniors. Only 30 business credits may be transferred; generally, upper-level business courses will not be acceptable as transfer credits.
- To receive a degree from the School of Business, the final 30 credits must be earned at the University of New Haven.
- A minimum of 121 semester hours is required for graduation.
- All students enrolled in upper-level courses (designated as 300 or higher) must have junior standing and must have completed all prerequisites. There is one exception: Upper-level communication (CO) courses may be taken prior to the junior year.

Admission Criteria

An applicant for admission to business programs must be a graduate of an approved secondary school or the equivalent. While no set program of high school subjects is prescribed, an applicant must satisfy all of UNH's admissions criteria, including the standard of the university with respect to the high school average. Applicants must present 15 acceptable units of satisfactory work, including nine or more units of college preparatory subjects. Satisfactory scores on College Entrance Examination Board Scholastic Aptitude Tests (SAT) or American College Testing (ACT) program tests are required. See the Admission section in the beginning of this catalog.

University Core Curriculum

In addition to departmental requirements, students must fulfill all requirements of the university core curriculum. See the University Curricula section of this catalog for the list of requirements. It should be noted that, whenever possible, liberal arts and lower division requirements should be completed by the end of the sophomore year.

Common Courses for Business Programs

Students earning bachelor's degrees in School of Business programs must complete the basic business curriculum shown below, as well as the university core requirements and the course requirements for their chosen major.

Required Courses

(For all majors except communication)

A	101	Introduction to Financial Accounting
A	102	Introduction to Managerial Accounting*
BA	100	Leadership in the Business Community
CO	100	Human Communication
LA	101	Business Law and the Regulatory Environment*
QA	118	Business Mathematics
EC	133-134	Principles of Economics I and II
EC	200	Global Economy**
QA	216	Probability and Statistics
QA	217	Advanced Statistics**
FI	313	Business Finance**
MG	31	Management and Organization**
MK	300	Principles of Marketing**
MG	550	Business Policy**

* *Accounting and finance majors take A 112 in place of A 102 and LA 111 in place of LA 101.*

** *Not required in the A.S., Business Administration.*

Minors

It is highly recommended that students working toward a degree in one area of study give serious thought to organizing their elective courses so as to receive a minor in a second discipline. A minor usually consists of 18 credit hours devoted to the study of either a group of courses on related subjects or a series of courses offered by one department.

Students interested in studying for a minor should consult with the chair of the department offering the minor. The minors available in the School of Business are:

Accounting
Business Administration (for nonbusiness majors)
Communication
Economics
Entrepreneurship (for business majors)
Finance
International Business

Marketing
Operations Management and Quantitative Analysis

Department of Accounting

Chair: Robert E. Wnek, J.D., LL.M., CPA

Professors: Ernest M. Dichele, LL.M., Boston University School of Law, CPA; Robert E. Wnek, LL.M., Boston University School of Law, CPA

Associate Professors: Robert McDonald, M.B.A., New York University, CMA, CPA, CIA, CFA; Michael J. Rolleri, M.B.A., University of Connecticut, CPA

Assistant Professor: Scott G. Lane, Ph.D., University of Kentucky

The accounting department is responsible for courses in accounting, business law and taxation. While the study of accounting has its roots in economic theory, the courses emphasize practical application to real world problems.

The study of accounting emphasizes the economic decision making process as well as the principles and procedures used to produce the information required by decision makers. Accounting promotes an appreciation for not only the nature of accounting information but also the use of that information in the complex process of decision making by individuals, business firms and government. The department of accounting at the University of New Haven seeks to serve the educational needs of those involved in all areas of accounting–public, private or governmental.

There are many career opportunities for students in the business world, government and academia. Accounting professionals are needed by consulting firms, public accounting firms and private industry as well as by federal, state and local governments. Because of the practical orientation of the program, future business entrepreneurs can benefit by the background obtained in these programs.

The accounting department at the University of New Haven offers courses at the bachelor's and master's level for the study of accounting. In addition, a five-year educational program is available to students who desire to meet the 150-credit-hour educational requirements necessary to take the Certified Public Accounting (CPA) Examination. Upon completion of these educational requirements a student will receive a combined bachelor's and master's degree in accounting.

Accounting students may select electives from other disciplines such as computer science, economics and finance.

On the graduate level, the department offers programs leading to master of science degrees in accounting and in taxation. A concentration in accounting is also available to students enrolled in the master of business administration program. Graduate certificates are offered in accounting and taxation.

Complete information about these graduate programs is available in the Graduate School catalog.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the School of Business.

B.S., Accounting

The accounting major is selected by those students wishing to pursue a career in management accounting, or in public accounting leading to the certified public accounting (CPA) license. The integration of business law, taxation and finance into the program provides the student with the necessary academic background to meet the challenges of the accounting profession.

Required Courses

Students earning a B.S. in accounting are required to complete 121 credits including the university core curriculum, common courses for business majors and the courses listed below:

A 220 Intermediate Financial Accounting I
A 221 Intermediate Financial Accounting II
A 222 Intermediate Financial Accounting III

A 223 Cost Accounting I
A 331 Advanced Financial Accounting I
A 333 Auditing and Reporting Principles
A 335 Federal Income Taxation I
A 336 Federal Income Taxation II
A 350 Accounting Information Systems
E 220 Writing for Business and Industry
LA 111 Accounting Business Law I
LA 112 Accounting Business Law II

Accounting majors take A 112 instead of A 102 and LA 112 instead of LA 101 in the common courses for business programs. A 112 is the prerequisite for advanced accounting courses.

Minor in Accounting

Requirements for the accounting minor include a total of 18 semester hours. Students must complete the following courses:

A 101 Introduction to Financial Accounting
A 112 Introductory Accounting II
A 220-221 Intermediate Financial Accounting I & II

Plus two additional accounting courses with consent of the undergraduate accounting coordinator.

Department of Communication

Chair: Jerry L. Allen, Ph.D.

Professors: Jerry L. Allen, Ph.D., Southern Illinois University at Carbondale; Marilou McLaughlin, Ph.D., University of Wisconsin; Steven A. Raucher, Ph.D., Wayne State University; Donald C. Smith, Ph.D., University of Massachusetts at Amherst

Instructors: W. Vincent Burke, M.Ed., Springfield College; Paul C. Falcone, M.B.A., University of New Haven

Students develop a comprehensive understanding of communication from interpersonal to mass communication while majoring in organizational communication, public relations, advertising or mass communication (journalism, radio, television, film). This program blends theoretical concepts and skills, academic rigor and hands-on experience to prepare students for careers in business, the public sector or the media–or for graduate study.

An active internship is a valuable complement to students' classroom studies. The department has internship contacts with regional and national businesses, public service organizations, and print and electronic media. Communication majors can gain additional experience through writing for The Charger Bulletin (the student newspaper), being on the staff at WNHU-FM (the campus radio station), doing programming for local television, and producing specialized film and video programs.

Some faculty members have received national and international recognition; and all faculty members do research, publishing and have practical experience in their communication specialties. Faculty and some students belong to such professional organizations as the International Communication Association; the Public Relations Society of America; the Eastern Communication Association; the National Association of College Broadcasters; the National Academy of Television Arts and Sciences; the National Academy of Cable Programming; the National Federation of Local Cable Programming; the American Film Institute; the Broadcast Educators' Association; the Speech Communication Association; the Association for Educational Journalism and Mass Communication; the Organization for the Study of Communication, Language, and Gender; The World Communication Association; and the International Listening Association.

The journal of the Eastern Communication Association, one of the four regional communication associations and the oldest communication association in the United States, is currently edited by a member of the department.

In the interest of maximizing students' communication experiences as well as encouraging professional contacts and advancement, the department encourages students to enter regional and national competitions in public relations, advertising, radio, television and film.

Lambda Pi Eta

The department sponsors the Beta Kappa Chapter of Lambda Pi Eta, the national communication honor society. To receive honorary membership in this prestigious organization, students must have at least 45 university credits and at least nine credits in communication courses. They must have a 3.0 cumulative average and a 3.25 GPA in communication courses. Members become part of a national network of communication majors and may showcase their work at regional and national conferences.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the School of Business.

B.S., Communication

Required Courses

Students earning the B.S. in communication must complete 121 credit hours, including the university core requirements. Communication majors will take:

CO 101 Fundamentals of Mass Communication
CO 102 Writing for the Media
CO 205 Intercultural Communication
CO 300 Persuasive Communication
CO 301 Communication Theory and Research
CO 302 Social Impact of Media
CO 420 Communication and the Law
CO 500 Seminar in Communication Studies
and a series of electives in the following areas:

Advertising
Organizational Communication
Mass Communication
Public Relations

These elective courses are designed for students with a wide range of interests. Such students may envision becoming communication consultants, television camera operators, broadcasters, journalists, producers of documentary films, business managers, lawyers, politicians, informed citizens or researchers investigating the effects of communication on society and why people say what they say. It is the department's objective to assist students in the pursuit of these goals by providing them with a sound academic background.

Suggested Electives

Elective courses for the B.S. in communication are to be selected with the approval of the student's adviser. Choices might be made from, but are not limited to, the following:

CO 203 Radio Production
CO 212 Television Production I
CO 214 Elements of Film
CO 220 Film Production I
CO 306 Public Relations Systems and Practices
CO 309 Public Relations Writing
CO 312 Television Production II
CO 335 Advertising Media
CO 399 Media Campaigns
CO 400 Communication in Organizations
CO 410 Management Communication Seminar
CO 435 Advertising Seminar
J 201 News Writing and Reporting
J 311 Copy Desk
MK 305 Consumer Behavior
MK 307 Advertising and Promotion

B.A., Communication

For information on the B.A. in communication, see the College of Arts and Sciences section of this catalog.

A.S., Communication

Upon successful completion of the first two years of the four-year bachelor of science program in communication, students may petition to receive an associate in science degree with a major in communication. Students should consult with an adviser for specific information.

Minor in Communication

A total of 18 semester hours of communication course credits must be earned in order for a student to declare the area of study as a completed minor. This

work must include CO 100 Human Communication. The balance of the minor program is worked out in individual conference with the student and the communication department adviser.

Communication Certificates

The communication department offers certificates in journalism and mass communication. Students must complete 15 credit hours to earn a certificate. Students may choose to take these courses on a matriculated or nonmatriculated basis. For those students who choose the nonmatriculated option, it is not necessary to apply for admission to a degree program at the university. However, if you are admitted, the credits earned may be applied toward the requirements for a degree program.

Mass Communication Certificate

This program offers options in television production, radio production, writing for media, interpersonal communication or a combination of radio/television and film. All students are required to take 15 credit hours, including the following:

CO 100 Human Communication
CO 114 Production Fundamentals
Plus three other courses selected in consultation with an adviser.

Journalism Certificate

For more information on journalism certificate requirements, please refer to the College of Arts and Sciences section under the communication programs.

Graduate Studies

The communication department offers a graduate concentration and certificate. Please consult the Graduate School catalog for more information.

Department of Economics and Finance

Chair: Steven J. Shapiro, Ph.D.
Professor Emeritus: Ward Theilman, Ph.D., University of Illinois

Professors: Peter I. Berman, Ph.D., Johns Hopkins University; Phillip Kaplan, Ph.D., Johns Hopkins University; Joseph A. Parker, Ph.D., University of Oklahoma; Robert M. Rainish, Ph.D., City University of New York;

Associate Professors: Edward A. Downe, Ph.D., New School for Social Research; John J. Phelan, Ph.D., George Washington University; Steven J. Shapiro, Ph.D., Georgetown University; Zeljan Schuster, Ph.D., University of Belgrade; Kamal Upadhyaya, Ph.D., Auburn University

Assistant Professors: Wentworth Boynton, M.B.A., University of Rhode Island; Sanja Grubacic, Ph.D., University of Connecticut; George M. Pushner, Ph.D., Columbia University, CFP; Sean Reid, M.B.A., Incarnate Word College

Economics courses provide a basis for an understanding of economic structures, a wide range of domestic and international issues and trends in the economic life of modern societies. These courses offer training in analysis of economic problems as an aid to the evaluation of economic policies.

Introductory courses are designed to provide the foundation of economic knowledge which every citizen in a modern complex society should have so they may understand the decisions of individual economic units and the operation of a national economy as a whole.

Advanced courses are designed primarily for economics and business majors. They cover, in depth, specific economic topics. They also prepare students for economic research and management positions in financial institutions, individual organizations, government, or graduate study and teaching.

The department of economics has two major objectives: to function as a service department for other departments in the School of Business and other

schools of the university, and to offer a specialized education to students majoring in economics.

Students majoring in economics may choose either a bachelor of science in business economics or a bachelor of arts in economics.

Finance, as an area of study, is designed to promote an analytic appreciation of the financial system and the financial decision-making process in which society–through its individuals, business firms and governments–is continually engaged.

In particular, the study of finance provides a structured analysis of the financial system and the financial decision-making process as determinants of the economic wealth of the individual, the business firm and the nation. The study of finance enables the student to pursue the preparation required for a number of financial decision-making positions in government and industry, including the entire variety of financial institutions.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the School of Business.

B.S., Business Economics

The program in business economics is designed to prepare students for research or executive positions in business or government.

Required Courses

Students earning a B.S. in business economics must complete 121 credit hours including the university core curriculum, the common courses for business majors and the following:

EC 340 Microeconomic Analysis
EC 341 Macroeconomic Analysis
Plus five advanced courses in economics.

B.S., Finance

Required Courses

Students earning a B.S. in finance must complete 121 credit hours including the university core curriculum, the common courses for business majors and the following:

A 220 Intermediate Financial Accounting I
A 221 Intermediate Financial Accounting II
EC 340 Microeconomic Analysis, *or*
EC 341 Macroeconomic Analysis
FI 329 Corporate Financial Management
FI 330 Investment Analysis and Management
FI 345 Investment Institutions and Markets

Plus one of the following:
EC 342 International Economics
FI 325 International Finance

A student majoring in finance may add a minor in economics or accounting to the above.

Minor in Economics

Eighteen credit hours of economics courses are required for a minor including:

EC 133-134 Principles of Economics I and II
Plus four other advanced courses in economics

Minor in Finance

Requirements for the finance minor include a total of 18 semester hours. Students must complete the following courses:

FI 313 Business Finance
FI 329 Corporate Financial Management
Plus four other finance courses selected in consultation with a finance adviser.

Department of Management

Chair: Abbas Nadim, Ph.D., University of Pennsylvania

Professor Emeritus: Lynn W. Ellis, D.P.S., Pace University

Professors: Abbas Nadim, Ph.D., University of Pennsylvania; Allen Sack, Ph.D., Pennsylvania State University

Associate Professors: Gil B. Fried, J.D., Ohio State University; Pawel Mensz, Ph.D., Systems Research Institute of the Polish Academy of Sciences; Judith Neal, Ph.D., Yale University; Omid Nodoushani, Ph.D., University of Pennsylvania

Assistant Professors: Dale M. Finn, Ph.D., University of Massachusetts; Laurel R. Goulet, Ph.D., University of Connecticut; Robert Metchick, M.S., Cornell University; Anshuman Prasad, Ph.D., University of Massachusetts; Parbudyal Singh, Ph.D., McMaster University

At this time in history, when all of society's systems–governmental, technologic, societal, educational, industrial and military as well as business–are becoming more sophisticated and complex, the need for skilled managers has never been greater. Today's managers must direct their attention to global competition, delivery of quality products and services, and managing the interaction with their internal and external environments. The management programs at UNH seek to provide students with the foundations of knowledge and skill necessary for moving to positions of responsibility in management. The study of theories and methods of analyzing decisions will prepare students for entry-level jobs as well as sharpen the skills of those already holding organizational positions. The underlying concept is to combine adequate specialization with the integrative point of view required of the manager.

The department of management offers degree programs in the following areas: associate in science degree program in business administration and bachelor of science degree programs in business administration and management of sports industries, along with minors in business administration, management and entrepreneurship.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the School of Business.

B.S., Business Administration

In order to function effectively in a variety of management situations, administrators should be conversant with all major areas of management. Moreover, they should have a thorough understanding of the interrelationships which exist among the various functional groups within organizations. This point of view is essential for managers who are to participate effectively with others in the administrative group and who are to administer activities in their areas of responsibility in the best interest of the entire organization.

Required Courses

Students earning the B.S. in business administration must complete 121 credit hours including the university core curriculum, the common courses for business majors and the following courses:

IB 413 International Marketing
MG 331 Management of Human Resources
MG 350 Management of Workforce Diversity
MG 455 Total Quality Management
MG 512 Contemporary Issues in Business and Society
MG 515 Management Seminar

Concentration in Management of Sports Industries

Within the B.S. in business administration program, a concentration in management of sports industries is available to meet the special interests of some students. Students taking the B.S. in business administration with this concentration complete 121 credits including the university core curriculum, the common courses taken by all business majors and the courses listed below:

MG 120 Development of American Sports
MG 330 Management of Sports Industries
MG 331 Management of Human Resources
MG 335 Public Relations in Sports

MG 350 Management of Workforce Diversity
MG 425 Sports Industries and the Law
MG 455 Total Quality Management
MG 512 Contemporary Issues in Business and Society
MG 515 Management Seminar

B.S., Management of Sports Industries

The sports industry is one of the fastest growing segments of our economy. As the industry expands, so does the need for sports management specialists trained in business management skills and sensitive to the unique features of the sports enterprise. College graduates in sports management can pursue careers in professional sport franchises, coliseum and arena management, ski resorts, corporate fitness centers, college sport programs, sports media industries, sporting goods merchandising and a wide variety of other sport-related areas.

Students earning the B.S. in management of sports industries complete 121 credits including the university core curriculum, the common courses taken by all business majors and the specialized courses listed below:

MG 120 Development of American Sports
MG 330 Management of Sports Industries
MG 331 Management of Human Resources
MG 335 Public Relations in Sports
MG 350 Management of Workforce Diversity
MG 420 Sports Facility Management
MG 425 Sports Industries and the Law
MG 512 Contemporary Issues in Business and Society
MG 597 Practicum
Plus a business elective

A.S., Business Administration

Students earning the A.S. in business administration must complete 61 credit hours including those courses listed below:

A 101 Introduction to Financial Accounting
A 102 Introduction to Managerial Accounting
BA 100 Leadership in the Business Community
CS 107 Introduction to Data Processing
EC 133-134 Principles of Economics I and II
LA 101 Business Law and the Regulatory Environment
M 127 Finite Mathematics
MG 115 Fundamentals of Management
QA 118 Business Mathematics
EC 200 Global Economy
QA 216 Probability and Statistics

Minor in Business Administration

(for Nonbusiness Majors)

A total of 18 semester hours of business course credits must be earned in order for a student to declare the field as a completed minor area of study. The minor in business administration is open to nonbusiness majors. The courses required for a minor in business administration are:

A 101 Introduction to Financial Accounting
BA 100 Leadership in the Business Community
EC 133 Principles of Economics I, *or*
EC 134 Principles of Economics II
LA 101 Business Law and the Regulatory Environment
MG 115 Fundamentals of Management
MK 300 Principles of Marketing

Minor in Entrepreneurship

(for Business Majors)

The United States is comprised of two economies–big business and small business. Virtually all businesses begin as a small business initiated by an entrepreneur with an idea or vision. Ninety-five percent of all businesses in the United States are small businesses. Entrepreneurship and small business are dynamic and powerful interactive forces in these increasingly difficult economic times.

The University of New Haven offers a minor in entrepreneurship as a means of preparing students who plan to start a business, wish to purchase an existing business or expect to join the family business after graduation. In addition, this minor may also provide an intrapreneurship foundation for students who aspire to work in big business.

This minor is a multidisciplinary approach to entrepreneurship that integrates the business disci-

plines with communication, negotiation and presentation skills. Furthermore, the program links theory and practice by tying together the best academic developments with the most effective business approaches.

A total of 15 semester hours of business course credits must be earned in order for a student to declare the field as a completed minor area of study. The courses required for a minor in entrepreneurship are listed below:

MG 317 Entrepreneurship and New Business Development
MG 327 Business Planning
MG 417 Managing an Entrepreneurial Venture*
MG 517 Practical Field Studies

Plus one of the following electives:

FI 371 Structuring and Financing a New Business
MG 457 Family Business Management
MG 467 Franchising

** Students in entrepreneurship minor will take MG 417 in place of MG 455.*

Department of Marketing and International Business

Chair: Ben B. Judd, Jr., Ph.D.

Professor Emeritis: Robert P. Brody, D.B.A. Harvard University

Professors: Ben B. Judd, Jr., Ph.D., University of Texas at Arlington; Michael Kublin, Ph.D., New York University; David J. Morris, Jr., Ph.D., Syracuse University

Associate Professor: George T. Haley, Ph.D., University of Texas at Austin

The disciplines of marketing and international business investigate business practices and strategies needed to attract customers and compete effectively in a free market system. Business is global. Therefore, both disciplines examine markets and competition from a global perspective. However, marketing places a greater emphasis on practices and strategies in the domestic environment, while international business focuses more on multinational issues. Both programs have recently added coverage of the emerging impact of e-commerce on business practices.

The sequence of courses in both programs include five required and two elective courses which culminate in an integrative capstone course. Students wishing to pursue internships are encouraged to use that experience as one of their electives. Normally, internships are scheduled during the senior year.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator for the School of Business.

B.S., Marketing and Electronic Commerce

Marketing is the study of the processes for developing and distributing goods and services attractive to selected customer groups. These markets may include both consumer and organizational (industrial, governmental, or non-profit) groups. Understanding of these customers results from studies of psychological and sociological perspectives and from the use of research tools. Based on these understandings, competitive strategies and distribution channels can be devised to reach the desired customers more effectively. The emergence of e-commerce has substantially modified some of the existing strategies for understanding the customer and for managing channels of distribution.

Required Courses

Students earning a B.S. in marketing must complete 121 credit hours. These courses must include the university core curriculum, common courses for business majors and the five courses and two electives listed below:

MK 302 Organizational Marketing
MK 305 Consumer Behavior
MK 326 Overview of E-Commerce

MK 442 Marketing Research in the Global Environment
MK 515 Marketing Management

Plus two of the following:

IB 413 International Marketing
MK 307 Advertising and Promotion
MK 316 Sales Management
MK 321 Retail Management
MK 327 E-Commerce Consumer Applications
MK 402 Marketing of Services
MK 450 Special Topics
MK 598 Internship
MM 301 Introduction to Multimedia

Transfer students with transfer credits in marketing major courses below the junior level must validate these credits by either passing a challenge examination or passing another major course at a higher level.

B.S., International Business

The study of international business is designed to prepare students for careers dealing with international trade at domestic and multinational corporations. Courses include coverage of international economic issues, research techniques, cross-cultural perspectives and political issues. In addition to the required and elective courses specific to the major, students are encouraged to use as many as possible of their general electives for coverage of history and political science relevant to international trade.

Required Courses

Students earning a B.S. in international business must complete 121 credit hours. These courses must include the university core curriculum, common courses for business majors and the five courses and two electives listed below:

CO 205 Intercultural Communication
FI 25 International Finance
IB 413 International Marketing
MK 442 Marketing Research in the Global Environment
IB 549 Global Business Strategy

Plus two of the following:

EC 342 International Economics
HS 260 Modern Asia
HS 262 Modern Chinese History
HS 264 Modern Japanese History
HS 351 Russia and the Soviet Union
HS 446 Europe in the Twentieth Century
IB 421 Operation of the Multinational Corporation
IB 422 International Business Negotiations
IB 450 Special Topics
IB 598 Internship
MK 326 Overview of E-Commerce
PS 241 International Relations
PS 243 International Law and Organization
PS 281 Comparative Political Systems: Asia
PS 282 Comparative Political Systems: Europe
PS 283 Comparative Political Systems: Latin America
PS 285 Comparative Political Systems: Middle East

Minor in Marketing

(Nonbusiness Majors)

Required Courses

MK 300 Principles of Marketing
MK 316 Sales Management

Plus three of the following:

MK 302 Orgranizational Marketing
MK 305 Consumer Behavior
MK 307 Advertising and Promotion
MK 321 Retail Management
MK 402 Marketing of Services
MK 450 Special Topics
MK 515 Marketing Management
MK 598 Internship

Minor in Marketing

(Business Majors)

Required Courses

MK 300 Marketing

Plus four of the following:

MK 305 Consumer Behavior
MK 307 Advertising and Promotion
MK 316 Sales Management

MK 402 Marketing of Services
MK 442 Marketing Research in the Global Environment
MK 450 Special Topics
MK 515 Marketing Management

Minor in International Business
(Nonbusiness Majors)

Required Courses

EC 200 Global Economy
MG 310 Management and Organization
MK 300 Marketing

Plus two of the following:

CO 205 Intercultural Communication
IB 413 International Marketing
IB 421 Operation of the Multinational Corporation

Minor in International Business
(Business Majors)

CO 205 Intercultural Communication
FI 325 International Finance
IB 413 International Marketing
IB 421 Operation of the Multinational Corporation

Plus one 400- *or* 500-level IB course

Department of Public Management

Chair: Charles N. Coleman, M.P.A.

Professor: Jack Werblow, Ph.D., University of Cincinnati

Associate Professor: Margaret L. Frank, Ph.D., University of Texas Health Science Center at Houston.

Assistant Professor: Charles N. Coleman, M.P.A., Wesr Virginia University

Public administration is no longer an undergraduate major. Courses, however, are offered for criminal justice and other majors.

Department of Quantitative Analysis

Chair: William S.Y. Pan, Ph.D.

Professor Emeritus: Warren J. Smith, M.B.A., Northeastern University

Professors: Linda R. Martin, Ph.D., University of South Carolina; William S.Y. Pan, Ph.D., Columbia University

Associate Professor: Pawel Mensz, Ph.D., Systems Research of the Polish Academy of Sciences

Minor in Operations Management and Quantitative Analysis

The field of operations management is directly related to creation and delivery of the product in both service and manufacturing industries. The focus is on the operating end of the business where the resources (production capacity, human skills and raw materials) are transformed into goods and services. Since every organization—from banks to fire departments, retail stores, hospitals or manufacturing facilities—is built around its product(s), the need for related knowledge of operations management is unquestionable.

As pressures for quality, time-based competition and a more integrated approach to management increase, a minor in operations management and quantitative analysis will expand options and increase marketability for business students.

A total of 15 credit hours are required:

MG 455 Total Quality Management
QA 217 Advanced Statistics
Plus three of the following:

A 223 Cost Accounting I
MK 470 Marketing Channels
QA 328 Quantitative Techniques in Management
QA 350 Quantitative Techniques
QA 380 Operations Management
QA 428 Forecasting for Decision Making
QA 480 Project Management
QA 598 Internship
QA 599 Independent Study

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

John Sarris, Ph.D., interim dean

Engineering and the applied sciences are dynamic professions that use knowledge, judgment and creativity for solving some of the most important and interesting challenges of society. These challenges and the changing face of engineering will shape the world of the twenty-first century—a world of exotic materials, new sources of energy, staggering telecommunications and computing capabilities, cybernetic factories and needed public works.

Few professions can match engineering for its challenge and excitement, or for its essential spirit of play. This quality is true for each of the school's seven engineering programs–in chemical, civil, computer, electrical, general, industrial and mechanical engineering–and also for its applied science programs in computer science and chemistry. The rewards of an engineering career include challenging tasks, social status, appealing working conditions and compensation. All of these are in addition to the great satisfaction of seeing your accomplishments in the real world of engineered components and systems.

The mission of the School of Engineering and Applied Science (SEAS) is to prepare individuals for professional practice in diverse engineering areas, computer science and chemistry. In addition, SEAS prepares individuals for life-long education in their professional careers, and for such formal post-baccalaureate education as their inclination and professional growth require.

As part of this preparation, students will become proficient in:

- the basic science, mathematics and engineering skills required in their chosen profession;
- design and synthesis;
- using and integrating computer technology in the practice of their profession;
- considering the social, political, economic and safety concerns and practices of a diverse community in developing their professional solutions;
- written, oral, graphical and multimedia communication;
- working as a member of a team and leading a team;
- considering legal and ethical issues related to their profession.

The School of Engineering offers undergraduate programs leading to the bachelor of science degree and the associate in science degree.

At the graduate level, the School of Engineering offers programs leading to the master of science degree and graduate certificates. Detailed information about these graduate programs is in the Graduate School catalog.

Professional Accreditation

The curricula leading to the bachelor's degrees in chemical, civil, electrical, industrial and mechanical engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). The bachelor's degree program in computer science has had a successful initial review, and it is anticipated that official notification of accreditation will be received by September 2000 from the Computer Science Accreditation Board (CSAB).

Programs

Bachelor of Science

Chemistry
Chemical Engineering
Civil Engineering
Computer Engineering
Computer Science
Electrical Engineering

General Engineering
Industrial Engineering
Mechanical Engineering

Associate in Science

Chemistry
Chemical Engineering
Civil Engineering
Computer Engineering
Computer Science
Electrical Engineering
Industrial Engineering
Mechanical Engineering

Certificates

Computer Programming
Logistics

Graduate Programs
Master of Science

Computer and Information Science
Electrical Engineering
Environmental Engineering
Executive Engineering Management
Industrial Engineering
Mechanical Engineering
Operations Research

Dual Degree

M.B.A. /M.S. Industrial Engineering

Graduate Certificates

Civil Engineering Design
Computer and Information Science
Logistics
Logistics/Advanced
Quality Engineering

Admission Criteria

An applicant for admission to the SEAS programs should be a graduate of a secondary school of approved standing and should present 15 acceptable units of secondary school work. These should include four units of English, two units of algebra, one of plane geometry, one half of trigonometry and one unit each of physics and a second science. Deficiencies in English, mathematics and science may be satisfied by summer school attendance, or by an extension of the stated curriculum for one or two semesters chosen to fit the student's needs.

Satisfactory placement in the Scholastic Aptitude Test (SAT) in mathematics and English as given by the College Entrance Examination Board, or satisfactory placement in the American College Testing (ACT) program is required.

Depending on the student's academic preparation, a student admitted to an engineering degree program path will be classified as enrolled either in *Engineering* or in *Pre-Engineering* within the program of his or her choice.

A student will be classified as *Pre-Engineering* if the student is required to take, or is taking, two or more courses not designated as part of the degree requirements in order to complete academic preparation for courses in the degree program.

A student will be classified as *Engineering* if the student is admitted to a degree program without any of the conditions mentioned above or the student has satisfactorily completed all courses required to complete academic preparation.

Admission Classification: Students choosing Computer Science or Chemistry will be so designated. Students choosing a degree program in engineering and satisfying all requirements will be classified as Engineering students. Students choosing a degree program in engineering and requiring additional coursework will be designated Pre-Engineering. Students reclassified into Engineering from Pre-Engineering will be notified officially by the degree program chair.

Choosing a Major

A student may be accepted into the School of Engineering and Applied Science without declaring a major in a specific engineering discipline. Students who have chosen a major should follow the recommended first-year program for the major. Students who are undecided about their choice of engineering major should choose the degree program General Engineering and follow the recommended first-year program. Those students wishing to complete an engineering degree program other than General

Engineering are strongly advised to decide on their new program by the beginning of the sophomore year. Students interested in Computer Science are advised to choose that option in their first year.

All newly admitted students, including transfer students, are assigned a faculty adviser in the degree program of their choice. Students choosing General Engineering are assigned a faculty adviser by the Dean of the School. The faculty adviser will monitor the progress of the student and will confirm the completion of requirements, if any to change the designation of the student from Pre-Engineering to Engineering.

The common course requirements for the freshman year of study in the engineering majors Civil Engineering (CE), Chemical Engineering (CM), Computer Engineering (CEN), Electrical Engineering (EE), General Engineering (GE), Industrial Engineering (IE) and Mechanical Engineering (ME) are:

First Semester

CH	115	General Chemistry I
CH	117	General Chemistry I Laboratory
E	105	Composition
ES	107	Introduction to Engineering
ES	108	Engineering Workshop (Note: ES 108 is not required for EE and IE)
M	117	Calculus I

Second Semester

CS	110	Introduction to C Programming I
E	110	Composition and Literature
EC	133	Principles of Economics I
M	118	Calculus II

Laboratory Science (a four-credit science course with a laboratory, specified by degree program)

Performance Requirements: A cumulative quality point average of 2.0 or better is required. The student must also achieve a grade of "C" or better for each of the mathematics (prefix M), physics (prefix PH) and chemistry (prefix CH) courses in this list. Students may repeat a course once to improve a grade.

New Transfer Students: Transfer students are required to take a minimum of 12 credits of coursework before their transfer credit evaluations are made official.

University Core Curriculum

In addition to school and department requirements, students must fulfill all requirements of the university core curriculum. (See University Curricula section of the catalog.) Included within the core are requirements in the humanities and social sciences. See the section below under Humanities Electives for details.

General Policy of the School of Engineering

The following definitions apply to all degree programs within the School of Engineering:

Transfer Credit

Transfer of credits for previous academic work is coordinated by the dean's office and assessed by department chairs, according to school policy, described in the document "Guidelines on Transfer Credit Awards." All transferred courses are the result of a determination of equivalence of course content and course level.

Once accepted as matriculated, students who wish to earn credits toward the degree through academic work at other institutions must secure approval in advance, using the "Coordinated Course Authorization" form.

Humanities Electives

Humanities and social science courses are intended to develop the competencies required of all SEAS professionals in creating the social, political, economic, cultural and aesthetically satisfying solutions to society's problems. Such courses assist also in understanding the needs of and communicating the options to the various constituencies which impact on and are affected by these societal problems and their solutions. Specific courses chosen must satisfy university core requirements.

Mathematics Electives

These are courses from the mathematics department at the 300 or higher level. Faculty advisers should be consulted for recommendations on the most relevant mathematics electives for a student's career objectives.

Technical Electives

Technical electives are upper-level courses directly pertinent to a student's major field of study. These electives must be approved by the student's faculty adviser and are usually chosen from engineering school courses. Faculty approval is important to ensure that students meet the prerequisite requirements.

Design Electives

Design electives within each program are those upper-level engineering courses that incorporate substantial design activities. Suitable courses include a (D) following the course title. These courses may also be used as technical electives.

The Co-op Program

Students in the School of Engineering and Applied Science may participate in the cooperative education program (Co-op) which enables students to combine practical, paid work experience in an activity associated with their professional degree program. This "earn while you learn" program combines experiential and academic preparation for a career. For further details see "The Co-op Program" section which appears earlier in this catalog or contact the SEAS co-op coordinator.

General Engineering

Faculty

The General Engineering program leading to the bachelor's degree is administered through the office of the Dean of the School of Engineering and Applied Science, with an oversight committee of faculty. All of the faculty of SEAS constitute the faculty for this degree program.

B.S., General Engineering

The bachelor of science in general engineering (GE) is a degree program designed for those interested in a career involving general engineering knowledge without the prescribed requirements of a specific engineering discipline. It provides complete flexibility for a student to combine engineering with any other undergraduate discipline within the university, such as studies in:

- business
- liberal arts
- computer science
- sciences
- teaching and education
- other UNH programs

It also provides the opportunity for including elements of two different engineering disciplines in one degree program.

Job opportunities depend on the combination selected and include:

- engineering and technical services
- technical management and sales
- engineering-related business activities
- music
- science-related activities
- computer-related activities
- technical writing
- medical services
- education

The Degree Program

The bachelor's degree program in general engineering requires completion of 121 credit hours. Within the program requirement, the student must complete a "minor" in a specific discipline by taking six courses, consisting of 18 credit hours, which are required to satisfy a minor in most disciplines within the university. Four freely selected engineering courses, consisting of 12 credit hours, are taken as engineering electives. Three courses, consisting of 9 credit hours, are taken as completely free electives. The required courses also include the university core as well as most of the science, mathematics and engineering science core required of all engineering disciplines.

Undecided Option

Students who wish to earn an engineering degree in a designated discipline (CE, CEN, CM, EE, IE or ME), but who are undecided about choice of discipline, should start the general engineering (GE) program and change majors to one of the specific degree programs when they have decided on an engineering

specialization. Making a choice by the end of the first year of study will result in a smooth transition.

Required Courses

Semester 3

HS 102 The Western World in Modern Times
IE 204 Engineering Economics
LA 101 Business Law and the Regulatory Environment
ME 101 Engineering Graphics
PH 150 Mechanics, Heat and Waves with Laboratory

Semester 4

CE 205 Statics and Strength of Materials
EE 201 Introduction to Electrical Circuits
M 203 Calculus III
PH 205 Electromagnetism and Optics with Laboratory

Semester 5

E 225 Technical Writing and Presentation
E 300 Writing Proficiency Examination
ES 345 Applied Engineering Statistics, *or* M 204 Differential Equations
One engineering course*
One minor course**
One social science elective

Semester 6

Two engineering courses*
Two minor courses**
One art/music/theatre elective

Semester 7

HS 306 Modern Technology and Western Culture, *or* HU 300 The Nature of Science
IB 312 International Business, *or* a business elective
One engineering course*
One minor course**
One philosophy/literature elective

Semester 8

ES 415 Professional Engineering Seminar
Two minor Courses**
Three free electives

*Any CE, CEN, CM, EE, IE or ME course for which prerequisites are met.

**Any set of courses, approved by the faculty adviser, in a single discipline such that these six courses taken together satisfy the requirements for a "minor" in the chosen discipline.

Department of Chemistry and Chemical Engineering

Chair: Michael A. Collura, Ph.D., P.E.

Professors: Michael A. Collura, Ph.D., Lehigh University (Process Design and Control, Computer Applications, Separation Processes; Peter J. Desio, Ph.D., University of New Hampshire (Organometallics, Ring-Chain Tautomerism in Orthoacylbenzoic Acids); Michael J. Saliby, Ph.D., SUNY at Binghamton (Thermal and Photochemical Reactions of Transition Metal Complexes); George L. Wheeler, Jacob Finley Buckman Professor of Chemistry and Chemical Engineering, Ph.D., University of Maryland (Biochemistry of Vision, Calcium Metabolism, Environmental Analysis)

Associate Professors: Arthur S. Gow, III, Ph.D., Pennsylvania State University (Phase Equilibria, Molecular Thermodynamics; Calorimetry; Kinetics)

Assistant Professors: W. David Harding, Ph.D., Northwestern University (Oxidation Catalysis, Pollution Prevention, Environmental Processes); Eddie Luzik, Ph.D., Bryn Mawr College (Synthesis and Properties of Substituted, Unsaturated Organic Molecules

Jacob Finley Buckman Endowed Chair and Scholarships

The Jacob Finley Buckman Endowed Chair of Chemistry and Chemical Engineering was established

in 1981 by Mrs. Clarice Buckman of New Haven in memory of her late husband, Jacob Finley Buckman, the co-founder of Enthone Corporation. The Clarice Buckman Scholarships are awarded to juniors and/or seniors majoring in chemistry or chemical engineering.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine practical, paid work experience in career fields with their college education. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator in the School of Engineering and Applied Science.

Chemistry Club/Forensic Science Club

The department has a chemistry club that is a student affiliate of the American Chemical Society. The club is open to all students, and all chemistry majors are encouraged to join. Club activities include projects, field trips, films, group discussions and social activities. Presently, the Chemistry Club is holding combined events with the Forensic Science Club.

Chemical Engineering Club

The Chemical Engineering Club has ties to the American Institute of Chemical Engineers (AIChE). It provides students with the opportunity to socialize, meet chemical engineers working in the area, visit process plants and get involved in community projects.

Chemical Engineering

Chemical engineers are creative problem solvers. They apply the fundamental principles of chemistry, physics, mathematics and economics to the solution of practical problems and to the search for new knowledge. Traditionally, chemical engineers develop, design, optimize and operate processes which convert material and energy resources into new or improved products. It was practitioners of this discipline who developed the technological infrastructure for industries such as chemicals, petroleum products, plastics, textiles, pharmaceuticals and food processing.

Currently, chemical engineers are concerned with the critical areas of resource depletion, energy conservation, recycling, pollution prevention and control, hazardous waste management, improved control of processes, increased safety and enhanced productivity. The major has also proven to be an excellent background for the study of law, medicine or business.

Mission and Goals

The mission of the Chemical Engineering Program is to prepare a diverse student body for entrance into the Chemical Engineering profession and for an evolving professional career. The following ten educational goals have been set to achieve the program mission:

- Students can demonstrate the understanding of and an ability to apply concepts in basic science and mathematics and have a working knowledge of advanced chemistry.
- Students can demonstrate the ability to apply the concepts of balances, rate and equilibrium relationships, and process/product/equipment analysis and design.
- Students can demonstrate the ability to effectively communicate technical ideas to a variety of audiences.
- Students can demonstrate proficiency in the use of computer tools typical of those used in the process industries for research, development, design and operation activities.
- Students can demonstrate the ability to develop solutions to open-ended problems which achieve balance among competing constraints.
- Students can demonstrate the ability to think creatively and to extend their knowledge through independent learning.
- Students can demonstrate the ability to design and conduct experiments, analyze data obtained, assess overall results, and make recommendations regarding the outcome of their work.
- Students can demonstrate the ability to apply an engineering approach to the solution of problems.
- Students are aware that solutions to technical problems have wide ranging effects on society. They can demonstrate the ability to incorporate consideration of such effects into their solutions.
- Students can demonstrate the ability to function as an integral member of a multidisciplinary team.

Achievement of these goals is assessed by a variety of means, including an *Individualized Student Assessment* (ISA). This assessment is performed by the faculty at the end of every chemical engineering course for each student in the class. Mastery level for each goal is rated on a numerical scale, which is linked to detailed objectives and performance criteria for that goal. Feedback is provided to the students via their departmental advisers in order to address any weaknesses. In addition, the compiled data is used to assess how well the course meets its stated objectives. Frequent meetings among the faculty to share this information assures a well-coordinated curriculum for the students.

B.S., Chemical Engineering

The chemical engineering program is challenging and demands hard work, but for those genuinely interested, it develops the required depth of knowledge to embark on a fascinating and satisfying professional career in industry or government, or to continue study at the graduate level. The B.S. in chemical engineering degree is accredited by the American Institute of Chemical Engineers (AIChE) and by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

The freshman year in chemical engineering is common with the other engineering disciplines, including ES 108 Engineering Workshop in the first semester and CH 116/118 General Chemistry II with Laboratory.

The first chemical engineering courses, taken in the sophomore year, are the beginning of a well-integrated sequence. Each chemical engineering course contributes uniquely to the development of skills in problem-solving, communication, computer usage and engineering design. Several common themes weave throughout these courses, including safety, concern for the environment and practical application of knowledge to real world problems. A comprehensive laboratory experience contributes to these educational objectives through the use of modern, industrial-type data acquisition and control instruments and computers on pilot-scale process equipment. Comprehensive design projects in the senior year enable the student to synthesize and focus the entire curriculum. Several engineering or science electives allow flexibility in the program for including areas of special interest.

Required Courses
(130 credits total including Freshman year)

Sophomore

CH	201- 202	Organic Chemistry I and II
CH	203- 204	Organic Chemistry I and II Laboratory
CM	201- 202	Fundamentals of Chemical Engineering I and II
CS	111	Introduction to C Programming II (for non-CS majors)
M	203	Calculus III
M	204	Differential Equations
PH	150	Mechanics, Heat and Waves with Laboratory
PH	205	Electromagnetism and Optics with Laboratory

One engineering elective (200-level or higher)

Junior

CH	331-332	Physical Chemistry I and II
CH	333-334	Physical Chemistry I and II Laboratory
CM	301	Transport Phenomena Analysis
CM	310	Transport Operations I with Laboratory
CM	311	Chemical Engineering Thermodynamics
CM	321	Rection Kinetics and Reactor Design
EE	201	Introduction to Electrical Circuits
HS	102	The Western World in Modern Times
IE	204	Engineering Economics
E	225	Technical Writing and Presentation, *or* an elective in the humanities or social sciences

Senior

CM	401	Mass Transfer Operations
CM	410	Transport Operations II with Laboratory
CM	420	Process Design Principles
CM	421	Plant and Process Design
CM	431	Process Dynamics and Control with Laboratory
ES	415	Professional Engineering Seminar

Plus one literature or philosophy elective, one art/music/theatre elective, one social science elective
Plus 6 credit hours of engineering or science electives

A.S., Chemical Engineering

The associate's degree in chemical engineering is not intended as a terminal degree. It may serve as a milestone, formally marking completion of half the bachelor's program requirements, or it may be combined with another engineering degree to obtain a broader background. All courses in the A.S. program count toward the B.S. program requirements. A.S. requirements include the common freshman engineering program, as discussed in the B.S. requirements description above, and the courses shown below.

Required Courses

(69 credits total including Freshman Year)

CH	201-202	Organic Chemistry I and II
CH	203-204	Organic Chemistry I and II Laboratory
CM	201-202	Fundamentals of Chemical Engineering I and II
CM	301	Transport Phenomena Analysis
CM	310	Transport Operations I with Laboratory
M	203	Calculus III
M	204	Differential Equations

Plus one social science elective and one art/music/theatre elective.

Minor in Chemical Engineering

Students who wish to earn a minor in Chemical Engineering should complete 6 courses in Chemical Engineering, including the following:

CM	201-202	Fundamentals of Chemical Engineering I and II
CM	301	Transport Phenomena Analysis
CM	310	Transport Operations I with Laboratory

Plus two additional chemical engineering (CM) courses.

Chemistry

Chemists are concerned with the structure and analysis of matter and the changes that matter undergoes. Today's chemists are solving chemical problems and developing new substances with the increasing use of laboratory instruments. Many of these instruments are interfaced with computers for rapid data analysis and display.

Careers for chemists in today's market include the rapidly developing fields of instrumentation, computers, energy, environment, forensics, medicine, safety and health, pharmaceuticals, product and equipment development, chemical engineering, plastics and polymers, synthetic fibers, industrial chemistry, technical sales and services, and management.

The B.S. in chemistry program consists of all the courses recommended by the American Chemical Society and provides a rigorous background well-suited for those students who will pursue graduate studies in chemistry. The program is also highly recommended for premedical students. The program contains six technical elective courses which allow the student to develop a concentration in a related field such as biology, forensic science, computer science, environmental studies or an engineering field.

Students majoring in forensic science may also earn a B.S. degree in chemistry by taking 12-16 credits in addition to those required for the B.S. degree in forensic science.

The B.A. program in chemistry appears in this catalog under the College of Arts and Sciences.

B.S., Chemistry

Required Courses

Students majoring in chemistry must complete the following courses for a total of 123-126 credits:

Freshman

CH	115-116	General Chemistry I and II
CH	117-118	General Chemistry I and II Laboratory
CS	110	Introduction to C Programming I
CS	111	Introduction to C Programming II (for non-CS majors)

E	105	Composition
E	110	Composition and Literature
M	117-118	Calculus I and II
PH	150	Mechanics, Heat and Waves with Laboratory

Sophomore

CH	201-202	Organic Chemistry I and II
CH	203-204	Organic Chemistry I and II Laboratory
CH	211	Quantitative Analysis with Laboratory
CH	221	Instrumental Methods of Analysis with Laboratory
HS	102	The Western World in Modern Times
M	203	Calculus III
PH	205	Electromagnetism and Optics with Laboratory

Plus one computer science (CS) elective, or an approved technical elective*

Plus one social science elective

Junior

CH	331-332	Physical Chemistry I and II
CH	333-334	Physical Chemistry I and II Laboratory
CH	341	Synthetic Methods in Chemistry
HU	300	The Nature of Science

Plus two technical electives*, one advanced chemistry elective, one literature or philosophy elective, one art/music/theatre elective, and a second social science elective.

Senior

CH	411	Chemical Literature
CH	412	Seminar
CH	451	Thesis with Laboratory, or advanced chemistry or chemical engineering course
CH	501	Advanced Organic Chemistry
CH	521	Advanced Inorganic Chemistry
CH	599	Independent Study, or advanced chemistry or chemical engineering course

Plus math/computer/biology electives and four technical electives.*

* To be chosen in consultation with student's adviser.

Teaching Chemistry

Students interested in earning a teaching certificate in secondary education in chemistry may enter the graduate program at UNH. The B.S. or B.A. in chemistry is the best choice for a major for those planning to teach at the secondary level, but other related majors are also acceptable. Students interested in teaching science at the middle school level need a variety of science courses, including chemistry. Please contact the education department for additional information.

B.A., Chemistry

The B.A. in chemistry program appears in the College of Arts and Sciences section of this catalog.

A.S., Chemistry

The associate's in chemistry degree includes about half of the courses required for the bachelor's degree. Students wishing to earn this degree must complete the common freshman engineering courses listed above for the B.S. degree, the university associate's degree core and several other designated courses. All courses taken for the associate's degree are applicable toward the bachelor's degree.

Minor in Chemistry

Students minoring in chemistry must complete 23-24 credit hours including the following courses :

Required Courses

CH	115-116	General Chemistry I and II
CH	117-118	General Chemistry I and II Laboratory
CH	201-202	Organic Chemistry I and II
CH	203-204	Organic Chemistry I and II Laboratory
CH	211	Quantitative Analysis with Laboratory
CH	221	Instrumental Methods of Analysis with Laboratory

Department of Civil and Environmental Engineering

Chair: Agamemnon D. Koutsospyros, Ph.D.

Professors Emeriti: M. Hamdy Bechir, Sc.D., Massachusetts Institute of Technology; John C. Martin, M.E., Yale University

Professors: Ross M. Lanius, Jr., M.S., University of New Haven, M.S.C.E., University of Connecticut; David J. Wall, Ph.D., University of Pittsburgh

Associate Professors: Gregory P. Broderick, Ph.D., University of Texas; Agamemnon D. Koutsospyros, Ph.D., Polytechnic University

Assistant Professor: Jean Nocito-Gobel, Ph.D., University of Massachusetts

Mission and Goals

The mission of the department of civil and environmental engineering is to create and administer a quality civil engineering program designed to achieve four major goals:

- educate a new generation of civil engineers to meet the challenges, demands and expectations of society;
- cultivate, enrich and promote scholarship, responsibility and service among our graduates;
- disseminate new knowledge; and
- nurture interdisciplinary education for solving the problems facing an ever-changing society.

In order to achieve its mission, the civil engineering program has the following objectives:

- provide educational experiences that prepare our students for professional practice of modern civil engineering in a global, societal and environmental context;
- promote scholarship and problem-solving skills;
- instill an understanding of the technical, economic, political, ethical and humanistic dimensions of civil engineering projects;
- prepare students to interact and communicate effectively in multidisciplinary fields;
- instill the need and provide the educational foundation for life-long learning; and
- encourage service to the civil engineering profession and the society through professional registration and community involvement.

Civil engineering is the broadest of the engineering professions and the parent from which most other fields of engineering have developed. The program in civil engineering provides students with the knowledge and skills required to identify and solve technical problems of society in a practical and ethical way. The curriculum provides an integrated educational experience that combines study in mathematics, basic and engineering science, communication, humanities and the social sciences while integrating practical experience in laboratory experimentation, problem solving and engineering design throughout the curriculum. The civil engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

The first two years of study include mathematics, basic science, communication, engineering science and design. The junior year courses are common for all civil engineering majors and include basic background courses in engineering science while integrating elements of design. In the senior year, concentrated engineering design courses are available in the areas of environmental engineering, geotechnical engineering, structures, transportation and water resources. Through the senior project courses and appropriate selection of technical electives, an in-depth study of a specialized area of civil engineering is possible. Humanities and social science courses are included at all levels of the curriculum.

The civil engineering program is enriched by a diverse student body which includes students with a wide range of ages, professional and nonprofessional experiences, and nationalities. Graduates of the program are encouraged to continue their education throughout their professional careers and to become registered professional engineers.

Student Chapter of the American Society of Civil Engineers

At UNH, an active student chapter of the

American Society of Civil Engineers sponsors technical lectures, field trips and social activities that offer an opportunity for students to interact with practicing professionals. Membership is open to all civil engineering students in good standing.

Chi Epsilon

Students with high academic standing are nominated annually for membership in Chi Epsilon, the national honor society for civil engineers.

B.S., Civil Engineering

Students must complete a total of 130 credit hours for a degree in civil engineering, including the engineering requirements for the freshman year listed earlier in this section and the university core requirements. Students are also required to earn a cumulative quality point ratio of no less than 2.0 in all civil engineering courses and technical electives. The required courses for the program are listed below:

Required Courses

The freshman year courses are the same as the common courses for the first year of the B.S. degree program in engineering described previously, with PH 150 Mechanics, Heat and Waves with Laboratory to be taken as the laboratory science course in the second semester of the freshman year.

Sophomore

CE	203	Elementary Surveying
CE	205	Statics and Strength of Materials
CE	218	Civil Engineering Systems
HS	102	The Western World in Modern Times
IE	204	Engineering Economics
M	203	Calculus III
M	204	Differential Equations
ME	101	Engineering Graphics
ME	204	Dynamics
PH	205	Electromagnetism and Optics with Laboratory

Plus a laboratory science (either BI 121 General and Human Biology with Laboratory, *or* CH 116 General Chemistry II and CH 118 General Chemistry II Laboratory)

Junior

CE	206	Engineering Geology
CE	304	Soil Mechanics
CE	306	Hydraulics
CE	309	Water Resources Engineering
CE	312	Structural Analysis
CE	323	Mechanics and Structures Laboratory
CE	408	Steel Design and Construction, *or* CE 409 Concrete Design and Construction, or CE 412Wood Engineering
M	371	Probability and Statistics I
ME	301	Thermodynamics I, *or* EE 201 Introduction to Electrical Circuits

Plus humanities/social science electives.

Senior

CE	301	Transportation Engineering
CE	315	Environmental Engineering
CE	327	Soil Mechanics Laboratory
CE	328	Hydraulics and Environmental Laboratory
CE	407	Professional and Ethical Practice of Engineering
CE	500-501	Senior Project I and II

Plus One art/music/theater elective, 9 credit hours of civil engineering technical electives of which 6 credits must be civil engineering design courses.

A.S., Civil Engineering

The associate's degree in civil engineering is not designed to be a terminal degree. It simply provides formal evidence that the student has completed about half of the courses required for the bachelor's degree program. Students wishing to earn this degree must complete the first three semesters of the B.S. in civil engineering program, satisfy the university associate's degree core and complete the fourth semester courses CE 206, CE 218, an art/music/theatre elective and any two of the following: IE 204, ME 204 or a laboratory science (BI 121, or CH 116 and 118).

Minor in Civil Engineering

Students are required to complete 18 credit hours

of civil engineering courses for the minor. With the approval of the chair, engineering majors may substitute other civil engineering courses for a minor.

Required Courses

Six courses from the following list:

CE 203 Elementary Surveying
CE 205 Statics and Strength of Materials
CE 218 Civil Engineering Systems
CE 301 Transportation Engineering
CE 304 Soil Mechanics
CE 306 Hydraulics
CE 309 Water Resources Engineering
CE 312 Structural Analysis
CE 315 Environmental Engineering
CE 407 Professional and Ethical Practice of Engineering

Department of Computer Science

Chair: Alice E. Fischer, Ph.D.

Professor Emeritus: Edward T. George, D.Engr., Yale University

Professors: Alice E. Fischer, Ph.D., Harvard University; Roger G. Frey, Ph.D., Yale University.

Associate Professors: William R. Adams, Ph.D., University of Connecticut; Tahany Fergany, Ph.D., University of Connecticut; Norman Hosay, Ph.D., University of Wisconsin; Howard Okrent, Ph.D., Massachusetts Institute of Technology

Assistant Professors: Barun Chandra, Ph.D., University of Chicago; David Eggert, Ph.D., University of South Florida;

Senior Lecturer: Elaine L. Sonderegger, E.E., Massachusetts Institute of Technology

Practitioners-in-Residence: Liberty Page, M.S., University of New Haven; Jacalyn Diesenhouse, M.A., Columbia University

The department of computer science offers both bachelor's and associate's degree programs in computer science. Their objectives are described below.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine practical, paid work experience in career fields with their college education. After the sophomore year, many computer science majors find co-op jobs, either during the summer or during the academic year. These jobs strengthen students' academic skills, allow students to gain perspective on their course work and provide the kind of experience that employers value. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator in the School of Engineering and Applied Science.

B.S., Computer Science

The goals of the bachelor's degree program are to inform, challenge and train our diverse student body for a constantly changing world of technology. A strong student will be prepared for graduate study in computer science. At graduation, every student should:

- have acquired a solid body of knowledge and understanding of computer hardware, software and theory as defined by the Association for Computing Machinery (ACM) guidelines;
- be able to communicate technical material in written English;
- be able to design and implement a system for a real application;
- have developed a professional level of skill in programming, both individually and as part of a team;
- be ready for employment at a professional level in industry;
- be aware of the legal and ethical issues that confront the field of computing;
- know the rights and obligations of the practicing computing professional; and
- be prepared for life-long learning in the field.

Typical initial job titles might be applications programmer or software engineer. Later titles might be systems analyst, team leader or software consultant. Areas of application range from database management to highly technical design projects.

The computer science program includes instruction in several programming languages and a strong base in mathematics. Intermediate courses include the study of systems, hardware and theory. Advanced courses are available in various application areas. With the help of the adviser, each student will also choose some area of interest outside of the computer science department and pursue a specialization in that field. It is often easy to extend this specialization into a minor in the selected field. Popular areas include mathematics, engineering, business, social sciences and multimedia.

Required Courses

A total of 127 credit hours, including the university core curriculum, is required for the degree of bachelor of science in computer science.

Freshman

CS	110	Introduction to C Programming I
CS	112	Introduction to C Programming II
CS	166	Fundamentals of Digital Computing
E	105	Composition
E	110	Composition and Literature
HS	102	The Western World in Modern Times
M	117-118	Calculus I and II

One social science elective

Plus the first semester of a laboratory science sequence

Sophomore

CS	226	Data Structures and Algorithms I
CS	314	Computer Organization
EE	255	Digital Systems I
EE	256	Digital System Laboratory
M	203	Calculus III

One art/music/theatre elective
One computer science (CS) elective
One social science elective

Plus the second semester of a laboratory science sequence and another laboratory science course

Junior

CS	310	Computing Theory
CS	320	Operating Systems
CS	326	Data Structures and Algorithms II
CS	330	Systems Programming/C
E	225	Technical Writing and Presentation
ES	345	Applied Engineering Statistics
HU	300	The Nature of Science

One literature/philosophy elective
One junior mathematics course *or* IE elective
Two specialization electives

Senior

CS	338	Structure of Programming Languages
CS	416	Computer Ethics

One CS design methodology elective
One CS elective
Two CS senior-level electives
Two technical electives
Two specialization electives
One humanities/social science elective

In addition, or as part of the preceding requirements, each student must complete a substantial programming project and demonstrate familiarity with another programming language in addition to C.

A.S., Computer Science

This two-year associate's program is designed for part-time students and for those who wish to enter the job market as soon as possible. All credits can be applied toward the B.S. degree in computer science. It is recommended, however, that students enroll in the bachelor's degree program, earning the associate's degree as a stepping stone toward the B.S. in computer science. A total of 62 credit hours is required for the awarding of the A.S. in computer science.

Required Courses

Freshman

CS	110	Introduction to C Programming I
CS	112	Introduction to C Programming II
CS	166	Fundamentals of Digital Computing
E	105	Composition
E	110	Composition and Literature
HS	102	The Western World In Modern Times
M	117- 118	Calculus I and II

One Social Science elective.

Plus the first semester of a laboratory science sequence

Sophmore

CS	226	Data Structures and Algorithms I

CS 314 Computer Organization
EE 255 Digital Systems I
EE 256 Digital Systems Laboratory
M 203 Calculus III

One art/music/theatre elective
One computer science programming elective
Two technical electives

Plus the second semester of a laboratory science sequence

Minor in Computer Science

Students may minor in computer science by completing 19 credit hours of computer science courses. Those persons considering a minor in computer science should seek guidance from the CS undergraduate coordinator as early as possible. Students must complete the following courses:

CS 110 Introduction to C Programming I
CS 112 Introduction to C Programming II
CS 166 Fundamentals of Digital Computing
CS 226 Data Structures

Plus three CS electives selected from courses at the 300 level or higher

Computer Programming Certificate

This certificate is designed for individuals who require rapid entry into the job market as a computer programmer. Candidates do not need to matriculate into an associate's or bachelor's degree program at the university, but may enroll directly as a student pursuing a certificate. Credits earned toward the certificate may be applied toward the requirements for a degree program at a later date. Students must complete 22 credit hours including the following courses:

CS 110 Introduction to C Programming I
CS 112 Introduction to C Programming II
CS 166 Fundamentals of Digital Computing
CS 226 Data Structures

Plus a CS programming elective and three CS electives selected from courses at the 300 level or higher

Department of Electrical and Computer Engineering

Chair: Ali M. Golbazi, Ph.D.

Professor Emeritus: Gerald J. Kirwin, Ph.D., Syracuse University

Professors: Andrew J. Fish, Jr., Ph.D., University of Connecticut; Darrell W. Horning, Ph.D., University of Illinois; Daniel C. O'Keefe, Ph.D., Worcester Polytechnic Institute; Kantilal K. Surti, Ph.D., University of Connecticut

Associate Professors: Bouzid Aliane, Ph.D., Polytechnic Institute of New York; Ali M. Golbazi, Ph.D., Wayne State University; Bijan Karimi, Ph.D., Oklahoma State University

The department of electrical and computer engineering offers bachelor of science degrees in electrical engineering and in computer engineering, and at the graduate level, a master of science in electrical engineering with an option in computer engineering.

Electrical and computer engineering encompasses many practical and diverse technologies including electronics, electromagnetics, power, communications, control, microprocessors, computer systems, digital systems, signal and information processing, and fiber optics.

Electrical and computer engineers serve in many professional capacities, which require a thorough understanding of the scientific principles that govern electrical phenomena. These activities often lead to new concepts and techniques and sometimes, to the discovery of new phenomena. The technical complexity of the services or products provided by many companies requires personnel with the appropriate educational background.

Mission and Goals

The mission of the department of electrical and computer engineering is to prepare students from diverse backgrounds for professional practice and continued growth in electrical and computer engineering.

To accomplish this mission, the department is

committed to the following major educational goals:

- to provide an education recognized within the profession;
- to provide a broad-based educational experience;
- to create, develop and deliver new and innovative knowledge; and
- to prepare graduates for employment in professional practice and/or graduate study.

The curriculum is designed to provide students with the skills and the basic scientific background needed to become proficient in today's technology and to keep abreast of future developments in the electrical and computer engineering profession.

The early part of the program emphasizes electrical and computer engineering skills that form the background for the upper-level elective and design courses. Physics, chemistry, mathematics, computer programming, basic engineering science and general education courses supplement the required and elective electrical and computer engineering courses.

The upper-level electrical and computer engineering coursework provides areas of concentration for in-depth study. Students can choose additional technical electives from outside the area of concentration to provide more breadth of knowledge.

To influence our society's evolution, the electrical and computer engineer must acquire an understanding of our society, our cultural heritage, and the human condition. The engineer must communicate ideas to other engineers and to the public. The electrical and computer engineering program accomplishes this via liberal and humanistic studies. The university core requirements allow students to expand their cultural and intellectual horizons by exposing them to the humanities and social sciences. Students learn written and oral communication skills in three dedicated courses and apply these skills in the humanities and social science core courses as well as in laboratory and design courses of the major.

An important feature of the electrical and computer engineering curriculum is the design experience. Our students develop the ability to analyze appropriate models, conduct empirical tests, gather relevant information, interpret empirical tests, develop appropriate models, develop alternative solutions, formulate problems and synthesize in our laboratory sequence. This sequence of courses takes the student from a well-structured laboratory experiment in the sophomore year to the design project in the senior year in gradual steps. This project allows students to demonstrate engineering abilities by proposing, completing and reporting on a detailed engineering design.

Student Societies

The department of electrical and computer engineering sponsors a student section of the Institute of Electrical and Electronics Engineers. This organization supports visiting lecturers, educational workshops, field trips to surrounding industrial sites and social events.

Eta Kappa Nu, the national honor society for electrical and computer engineers, is represented by the Zeta Rho Chapter at the University of New Haven. This society exists to honor superior students and to encourage high scholastic achievements.

B.S., Electrical Engineering

The B.S. program in electrical engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

Electrical engineering is concerned with the analysis, design, development and operation of electrical and electronic systems. Examples of such systems include communication, fiber optics, data processing, power generation and distribution, control and instrumentation. Digital circuits and computers are important integral parts of such systems and are widely used by electrical engineers in their design and development. The electrical engineer is also concerned with the devices that make up systems such as transistors, integrated circuits, rorating machines, antennas, lasers and computer-memory devices.

Program Objectives

The educational objectives of the electrical engineering program are to produce graduates who:

- can think creatively to formulate and solve

electrical engineering problems;
- can design electrical engineering systems, subsystems or processes to meet performance, economic, safety and environmental specifications;
- have an understanding of professional and ethical responsibility as it relates to the electrical engineering profession;
- have a sufficiently broad foundation in electrical engineering to allow them to grow and develop with a rapidly changing technological environment;
- apply effective writing, speaking and communication skills in professional presentations;
- understand and apply the techniques, skills and tools of modern electrical engineering practice to analysis and design problems.

The bachelor of science in electrical engineering offers four upper-level concentration areas:

1. Communications–including communications systems, fiber optics, signal processing and stochastic systems
2. Control–including analog and digital control systems, fuzzy control
3. Digital–including sequential logic design, computer architecture microprocessors systems
4. Power–including machines, industrial power systems transmission and distribution.

Required Courses

Students must complete a total of 129 credit hours for a bachelor of science degree in electrical engineering including the requirements for the freshman year listed earlier in this section. Humanities or social science electives must be selected to fulfill the core curriculum requirements of the university and ABET.

Technical elective courses in the B.S.E.E. program must be selected from upper-level offerings (third or fourth year) under the guidance and approval of the student's academic adviser. At least three must be electrical and computer engineering departmental courses.

In the final year of study the student takes a senior design sequence EE 457 and EE 458 that is spread over two semesters. In the first semester the student selects a topic, does a literature search, and a preliminary design. In the second semester, the student completes design, implements project and presents results.

Freshman

CH	115	General Chemistry I
CH	117	General Chemistry I Laboratory
CS	110	Introduction to C Programming I
E	105	Composition
E	110	Composition and Literature
EC	133	Principles of Economics I
ES	107	Introduction to Engineering
M	117-118	Calculus I and II
PH	150	Mechanics, Heat and Waves with Laboratory

Sophomore

CS	111	Introduction to C Programming II (for non-CS Majors)
E	225	Technical Writing and Presentation
EE	201	Introduction to Electrical Circuits
EE	202	Network Analysis
EE	206	Electronic Materials and Devices
EE	255	Digital Systems I
EE	256	Digital Systems Laboratory
EE	257	Analog Circuits Laboratory
M	203	Calculus III
M	204	Differential Equations
ME	204	Dynamics
PH	205	Electromagnetism and Optics with Laboratory

Junior

EE	302	Systems Analysis
EE	320	Random Signal Analysis
EE	347- 348	Electronics I and II
EE	349	Electronics Design Laboratory
EE	371	Computer Engineering
EE	355	Control Systems
HS	102	The Western World in Modern Times

Plus one mathematics elective and two technical electives.

Senior

EE	445	Communication Systems
EE	457	Design Preparation
EE	458	Electrical Engineering Design Laboratory
EE	461	Electromagnetic Theory
ES	415	Professional Engineering Seminar
IE	204	Engineering Economics
ME	301	Thermodynamics I

Plus two technical electives, one art/music/theatre elective and one social science elective.

A.S., Electrical Engineering

The associate's degree in electrical engineering includes about half the courses required for the bachelor's degree. Students wishing to earn this degree must complete the following courses:

Freshman

CH	115	General Chemistry I
CH	117	General Chemistry I Laboratory
CS	110	Introduction to C Programming I
E	105	Composition
E	110	Composition and Literature
ES	107	Introduction to Engineering
HS	102	The Western World in Modern Times
M	117-118	Calculus I and II
PH	150	Mechanics, Heat and Waves with Laboratory

Plus one social science elective

Sophomore

CS	111	Introduction to C Programming II (for non-CS Majors)
PH	205	Electromagnetism and Optics with Laboratory
EE	201	Introduction to Electrical Circuits
EE	202	Network Analysis
EE	206	Electronic Materials and Devices
EE	255	Digital Systems I
EE	256	Digital Systems Laboratory
EE	257	Analog Circuits Laboratory
ME	204	Dynamics
EE	347	Electronics I
EE	371	Computer Engineering

Plus one art/music/theatre elective

Minor in Electrical Engineering

A student may obtain a minor in electrical engineering by completing the following courses:

EE	201	Introduction to Electrical Circuits
EE	202	Network Analysis
EE	255	Digital Systems I
EE	256	Digital Systems Laboratory
EE	257	Analog Circuits Laboratory

Plus one of the following sequences:

EE 347-348 Electronics I and II, *or* EE 371 Computer Engineering and EE 356 Digital Systems II, *or* EE 302 Systems Analysis and EE 355 Control Systems

The student must fulfill the prerequisites for these courses.

Students contemplating either a minor or an associate's degree should consult with the department chair early in their program.

B.S., Computer Engineering

Coordinator: Darrell W. Horning, Ph.D.

The computer engineering discipline is concerned with design and implementation of digital systems such as computer systems, computer-based control systems, interfaces between digital and analog systems, interfaces between hardware and software and control software for embedded computer systems. This program spans the disciplines of both electrical engineering and computer science, and can loosely be described as bridging the area between the two.

Computers are used in almost every device or system manufactured today, from large multi-computer systems to cell phones, and credit card reading devices. In addition, they are used in signal processing applications, speech recognition, medical imaging, and picture and data communication. Internet and the web are possible in part because of advances in computing machines and data communication created by people working in the capacity of computer engineers. Careers for computer engineers are found in all phases of the production of these devices and systems, from design, manufacturing and maintenance to marketing, and sales.

Educational Objectives

Upon completion of the program, a graduate of the computer engineering program should be able to:

- demonstrate both hardware and software skills and understanding,
- understand the design tradeoffs between hardware and software,

- design embedded real-time systems,
- design and interface between a computer system and a digital communication system network,
- design a processor and understand basic computer architecture and organization.

Design and problem solving are the central themes of this program. This engineering area uses the engineering and hardware approach of electrical engineering, and the knowledge of computing structures and the algorithmic approach of computer science. The first two years of the program concentrate on basic science, mathematics and engineering. The last two years are comprised of courses in traditional digital systems, computer systems, networks, electrical systems and design of software systems. There are four electives in the fourth year that give the student an opportunity to explore a hardware and software-oriented program. The final year has a senior design course spread over two semesters in which the student designs a device, system or software application. Depending on the student's interests, the project can be hardware oriented, software oriented or hardware/software oriented. The program also has a general education component in communications, economics and the humanities needed to create a well-rounded professional.

Required Courses

Students must complete a total of 128 credit hours for a bachelor of science degree in computer engineering. Humanities or social science electives must be selected to fulfill the core curriculum requirements of the university.

Program core courses are advanced CS or EE courses that are considered to be in the area of computer engineering. The technical electives are any 300-level or above CS or EE courses that fit into the student's plan of study and are approved by the academic advisor.

In the final year of study the student takes a senior design sequence CEN 457 and CEN 458 that is spread over two semesters. In the first semester the student selects a topic, does a literature search, and a preliminary design. In the second semester, the student completes design, implements project and presents results.

The following list shows the sequence of courses that a student should follow to complete the program in four years.

Freshman

CH	115	General Chemistry I
CH	117	General Chemistry I Lab
CS	110	Introduction to C Programming I
CS	112	Introduction to C Programming II
CS	166	Fundamentals of Digital Computing
E	105	Composition
E	110	Composition and Literature
ES	107	Introduction to Engineering
M	117-118	Calculus I and II
PH	150	Mechanics, Heat and Waves with Laboratory

Sophomore

CS	226	Data Structures and Algorithms I
E	225	Tech Writing and Presentation
EE	201	Introduction to Electrical Circuits
EE	255	Digital Systems I
EE	256	Digital Systems Lab
EE	356	Digital Systems II
EE	371	Computer Engineering
HS	102	The Western World in Modern Times
M	203	Calculus III
M	204	Differential Equations
PH	205	Electromagnetism and Optics with Laboratory

Junior

CS	320	Operating Systems
CS	330	Systems Programming/C
CS	526	Object-Oriented Principles and Practice/C++
EC	133	Principles of Economics I
EE	347	Electronics I
EE	257	Analog Circuits Laboratory
EE	302	Systems Analysis
EE	320	Random Signal Analysis
EE	472	Computer Architecture
EE	475	Microprocessors
IE	204	Engineering Economics

Senior

CS	416	Computer Ethics

CS 447 Computer Communications
CEN 457 Design Preparation
CEN 458 Senior Design Laboratory

Plus four technical electives, one literature/philosophy elective, one social science elective and one art/music/theatre elective

Official notification of approval by the Board of Governors for Higher Education, State of Connecticut, is anticipated in September 2000 for the degree program in computer engineering.

A.S., Computer Engineering

The associate's degree in computer engineering includes about half the courses required for the bachelor's degree. Students wishing to earn this degree must complete the following courses:

Freshman

CH 115 General Chemistry I
CH 117 General Chemistry I Lab
CS 110 Introduction to C Programming I
CS 112 Introduction to C Programming II
CS 166 Fundamentals of Digital Computing
E 105 Composition
E 110 Composition and Literature
ES 107 Introduction to Engineering
M 117-118 Calculus I and II
PH 150 Mechanics, Heat and Waves with Laboratory

Sophomore

CS 226 Data Structures
CS 320 Operating Systems
E 225 Technical Writing and Presentation
EC 133 Principles of Economics I
EE 201 Introduction to Electrical Circuits
EE 255 Digital Systems I
EE 256 Digital Systems Lab
EE 371 Computer Engineering
HS 102 The Western World in Modern Times
PH 205 Electromagnetism and Optics with Laboratory

Plus one art/music/theatre elective

Minor in Computer Engineering

A student may obtain a minor in computer engineering by completing the following courses:

CS 166 Fundamentals of Digital Computing
CS 226 Data Structures and Algorithms I
EE 201 Introduction to Electrical Circuits
EE 255 Digital Systems I
EE 256 Digital Systems Lab
EE 347 Electronics I
EE 371 Computer Engineering I

Department of Industrial Engineering

Chair: Ronald N. Wentworth, Ph.D.

Professor Emeritus: William S. Gere, Jr., Ph.D., Carnegie-Mellon University

Professors: Ira H. Kleinfeld, Eng.Sc.D., Columbia University; M. Ali Montazer, Ph.D., State University of New York at Buffalo; Alexis N. Sommers, Ph.D., Purdue University; Ronald N. Wentworth, Ph.D., Purdue University

The department of industrial engineering offers bachelor of science and associate in science degrees in industrial engineering. A master of science in industrial engineering and a dual M.B.A./M.S.I.E degree program are available at the graduate level.

Mission and Objectives

The mission of the industrial engineering program is to provide a solid educational foundation which prepares students for employment as industrial engineers in the rapidly changing environment of world class manufacturing and service industries. This mission includes preparation of students for the professional practice of industrial engineering, for pursuit of graduate studies and for life-long learning; and this mission is consistent with that of the School of Engineering and Applied Science (SEAS).

In order to achieve this mission, the industrial engineering program has established a set of specific educational objectives to ensure that its graduates have acquired abilities to:

- design, evaluate, and improve complex human/machine systems, procedures and methods;
- communicate effectively, interact with others and function on multidisciplinary teams;
- utilize problem-solving skills necessary to increase productivity and competitiveness in manufacturing, service and trade;
- long learning and the pursuit of graduate study;
- understand economic, quality and social considerations in the design of complex industrial engineering systems;
- address ethical, safety and environmental issues involved in the professional practice of industrial engineering.

The industrial engineering department's programs combine strong theoretical foundations in science, mathematics, probability and statistics, human factors/ergonomics, humanities and social sciences with industrial engineering and computer applications in order to improve effectiveness in virtually all industries and economic sectors–including manufacturing, transportation, service and government. The department's graduates will be prepared to address issues of operational design, process and product quality, methods improvement and facilities design.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine practical, paid work experience in career fields with their college education. For further details see "The Co-op Program" which appears earlier in the catalog or contact the Co-op coordinator in the School of Engineering and Applied Science.

Student Chapter of I.I.E.

Students are encouraged to join, at a reduced membership fee, the student chapter of the Institute of Industrial Engineers (I.I.E.). The student chapter is affiliated with a local senior chapter of I.I.E., enabling students to develop a sense for the practice and direction of the profession.

B.S., Industrial Engineering

Industrial Engineering is one of the most flexible and diverse of all engineering disciplines, providing a broad view of the complex interrelated activities necessary to produce a product or service efficiently in a competitive market. Through selection of elective courses, an industrial engineering student can specialize in a broad range of areas applicable to manufacturing and seervice industries, including quality control, ergonomics, work design, operations research, production control, facilities planning, logistics and manufacturing.

Industrial engineering is concerned with the design, evaluation, and improvement of human/machine systems, processes and methods considering such factors as economics, safety, the environment and ethics. The skills imparted and insights developed in the graduates are intended to be useful for professional practice in a wide spectrum of manufacturing industries; in transportation; in insurance and service industries; in government, retail trade and commerce. Expertise in industrial engineering is presently highly sought, as the joint concern for productivity and quality improvement is manifested throughout the national and global economy. Industrial engineers are among the most upwardly mobile of those in the engineering profession by virtue of their training and expertise. Many industrial engineers have attained top management positions in a variety of industries.

Our program provides a broad engineering background during the first two years. In the last two years, students are required to take an ensemble of courses which are designed to shape the student's expertise in industrial engineering. These include courses in manufacturing, robotics, quality control, production, facilities planning, operations research, ergonomics and simulation modeling.

The department of industrial engineering has extensive laboratory facilities in support of its academic programs. These include laboratories in human factors/ergonomics, manufacturing engineering, work design, facilities planning, computer-aided design and computer-aided manufacturing (CAD/CAM), and robotics.

The program in industrial engineering is the only one of its kind offered in Connecticut. It is accredited by the Engineering Accreditation Commission of the

Accreditation Board for Engineering and Technology (EAC/ABET).

Required Courses

Students earning the bachelor of science in industrial engineering (B.S.I.E.) must complete 125 credit hours including the university core curriculum. Students who, at the time of application, are not adequately prepared are designated as Pre-Engineering, as detailed earlier under the SEAS section. Upon successful completion of the preparatory courses, students are then formally designated as Engineering. The program also includes three credit hours of internship or a technical elective which is chosen in consultation with the student's adviser for relevancy and content. Internship refers to project work related to industrial engineering with local industries. Under the umbrella of B.S.I.E., students have the option of choosing a concentration in manufacturing systems, quality systems, computer systems, or information systems. The latter two concentrations consist of courses from the electrical and computer engineering and computer science programs. The B.S.I.E. curriculum is as follows:

Freshman Year

CH 115 General Chemistry I
CH 117 General Chemistry I Laboratory
E 105 Composition
ES 107 Introduction to Engineering
M 117 Calculus I

CS 110 Introduction to C Programming I
CH 116 General Chemistry II and CH 118 General Chemistry II Laboratory, *or* BI 121 General and Human Biology I with Laboratory
E 110 Composition and Literature
EC 133 Principles of Economics I
M 118 Calculus II

Sophomore Year

E 225 Technical Writing and Presentation
IE 204 Engineering Economics
M 203 Calculus III
ME 101 Engineering Graphics
PH 150 Mechanics, Heat and Waves with Laboratory
CE 205 Statics and Strength of Materials
IE 243 Work Design
M 204 Differential Equations
PH 205 Electromagnetism and Optics with Laboratory

Plus one literature or philosophy elective

Junior Year

E 300 Writing Proficiency Examination
EE 211 Principles of Electrical Engineering I
IE 304 Production Control
IE 346 Probability Analysis
IE 348 Manufacturing Processes

Plus one concentration elective

CS 111 Introduction to C Programming II (for non CS majors)
IE 344 Human Factors Engineering
IE 347 Statistical Analysis
ME 204 Dynamics

Plus one social science elective and one concentration elective

Senior Year

ES 415 Professional Engineering Seminar
IE 402 Operations Research
IE 435 Simulation and Applications
IE 436 Quality Control

Plus one art/music/theatre elective and one concentration elective

HS 102 The Western World in Modern Times
IE 414 Engineering Management
IE 443 Facilities Planning
IE 498 Internship, *or* a technical elective

Plus one concentration elective

Concentrations

Students may choose to concentrate in any of the following:

Manufacturing Systems

IE 437 Metrology and Inspection in Manufacturing
IE 460 Computer-Aided Manufacturing
IE 465 Robotics in Manufacturing
ME 200 Engineering Materials

Quality Systems

IE 311 Quality Assurance
IE 407 Reliability and Maintainability
IE 408 Systems Analysis
IE 437 Metrology and Inspection in Manufacturing

Computer Systems

CS 447 Computer Communications
EE 255 Digital Systems I
EE 371 Computer Engineering I
EE 475 Microprocessor Systems

Information Systems

CS 226 Data Structures and Algorithms I
CS 337 File Structures
CS 437 Database Systems
CS 478 Artificial Intelligence

Students who do not wish to adopt a concentration will have to complete four 300 or higher level courses (totaling at least 12 credits) in industrial engineering. In special cases, courses from other engineering disciplines and computer science may be taken with the approval of the department chair.

A.S., Industrial Engineering

The associate's degree in industrial engineering includes about half of the courses required for the bachelor's degree. Students wishing to earn this degree should contact the department chairman for up-to-date course requirements. Generally, however, the requirements include the freshman year courses, the university core for the associate degree and several designated courses in industrial engineering. All courses taken for the associate degree are applicable toward the bachelor's degree.

Minor in Industrial Engineering

Students enrolled in degree programs in the School of Engineering and Applied Science may take a minor in industrial engineering by completing 18 credit hours of industrial engineering courses. The coursework for the minor consists of the following required and elective courses.

Required Courses

IE 243 Work Design
IE 304 Production Control
IE 346 Probability Analysis
IE 347 Statistical Analysis

Elective Courses

Two 300 or higher level industrial engineering courses (6 credits) chosen with the approval of the student's adviser.

Logistics Certificate

Logistics is a discipline which has become critical to the efficient development and operational support of complex, costly systems. Its subdivisions include customer requirements planning, design-to-cost concepts, configuration control, life-cycle analysis, transportation and distribution, reliability and field support networks. Modern logistics is the science which ensures that needs are met when they occur, at a reasonable resource expenditure. UNH offers the following undergraduate certificate as well as a graduate certificate in logistics.

The undergraduate certificate sequence consists of five 3-credit courses followed by a 1-credit capstone logistics seminar. This course sequence provides students with a working knowledge of logistics and covers topics included in the Certified Professional Logistician examination of the Society of Logistics Engineers. These undergraduate-level courses are designed for professionals who either do not hold a college degree or who earned degrees in non-technical fields of study. Prerequisite courses in mathematics, computer science, economics and statistics may be needed by students who lack appropriate educational background.

The six-course series required for the logistics certificate includes:

LG 300 Defense Sector Logistics
LG 310 Introduction to Logistics Support Analysis
LG 320 Reliability and Maintainability Fundamentals
LG 410 Life Cycle Concepts
LG 440 Data Management in Logistics Systems
LG 490 Logistics Seminar

Department of Mechanical Engineering

Interim Chair: Stephen M. Ross, Ph.D.

Professor Emeritus: Thomas C. Warner, Jr., M.S., Massachusetts Institute of Technology

Professors: Carl Barratt, Ph.D., University of Cambridge; Oleg Faigel, Ph.D., Moscow Textile Institute; M. Jerry Kenig, Ph.D., Princeton University; Konstantine C. Lambrakis, Ph.D., Rensselaer Polytechnic Institute; Ismail Orabi, Ph.D., Clarkson University; Stephen M. Ross, Ph.D., Johns Hopkins University; B. John Sarris, Ph.D., Tufts University; Richard M. Stanley, Ph.D., Yale University

Assistant Professor: Samuel D. Bogan, Ph.D., Boston University

Mechanical engineering represents a wide diversity of pursuits including the analysis, design and testing of machines, products and systems essential to everyday life–everything from doorknobs, tennis rackets and fishing reels to power plants, skyscrapers and automobiles. Mechanical engineers work in a variety of fields such as aerospace, utilities, materials processing, transportation, manufacturing, electronics and telecommunications.

Mission and Goals

The mission of the mechanical engineering program is to graduate professionally competent and responsible students who can meet industry's current and future needs in the general area of mechanical engineering.

In order to achieve its mission, the mechanical engineering program must ensure that its graduates:

- apply knowledge in mathematics (through multivariate calculus and differential equations, with familiarity in statistics and linear algebra);
- apply knowledge in science (chemistry and calculus-based physics, with depth in physics);
- apply knowledge in engineering, including the formulation and solution of engineering problems;
- use techniques, skills and tools (contemporary analytic, computational and experimental) necessary for modern engineering practice;
- design, conduct and analyze results of experiments;
- actively participate in teams, including multidisciplinary teams;
- communicate effectively;
- accomplish design and realization of thermofluid and mechanical systems, components and processes;
- understand professional and ethical ramifications of engineering solutions within the context of modern society;
- engage in life-long learning; and
- succeed in the engineering profession.

Mechanical engineering classes are kept small (rarely more than 20 students) and are taught almost exclusively by full-time faculty. Experienced practitioners from industry also contribute their expertise in selected courses. Faculty and students work with industry in research and design projects. The Electric Vehicle Project is one that brings mechanical and other engineering students together in an effort to build and race a nonpolluting, practical, low-cost vehicle.

The B.S.M.E. program has been nationally accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET) for more than 30 years.

Several options for concentration are available for a student to pursue. Restricted elective courses may be selected, with the help of the student's faculty adviser, which offer the opportunity for further learning in areas such as fluids, energy, design, heat transfer, numerical analysis and computers, aerospace sciences and control systems.

Exceptional students having an overall average of 3.50 or better may join the Delta Zeta Chapter of the Pi Tau Sigma honorary fraternity, which provides the opportunity for closer relations with faculty and other prominent individuals in the field for the purpose of further professional development, involvement in faculty research and varied social and intellectual activities.

Practicum

It is recognized in the mechanical engineering department that on-the-job experience as an undergraduate student is a valuable tool in launching a successful professional career. It is desirable, then, for mechanical engineering majors to spend some time prior to graduation performing engineering-related

duties at a manufacturing company, consulting firm, technical organization, government agency, or some other appropriate setting.

Interns are required to complete a minimum of 300 hours of practical experience in an area or technical project closely related to mechanical engineering. The requirement may be satisfied through appropriate co-op work experience, part- or full-time employment, a summer job, an apprenticeship or volunteer work at any time during a student's undergraduate studies. Registration, proof of compliance or a request for waiver must be submitted to the department only after completion of 75 credit hours toward the B.S.M.E. degree. The practicum is graded on a Satisfactory/Unsatisfactory basis and carries no academic credit.

Student Chapter of ASME

Membership in the American Society of Mechanical Engineers student section is open to all mechanical engineering students of good standing and provides the opportunity for field trips to local industrial plants, attendance at technical presentations, social activities and access to interesting professional literature.

B.S., Mechanical Engineering

Required Courses

Students earning the bachelor of science in mechanical engineering are required to complete 127 credit hours, including the university core curriculum.

Freshman

In addition to the common first-year courses listed under the School of Engineering and Applied Science, mechanical engineering students take PH 150 Mechanics, Heat and Waves with Laboratory for the laboratory science course plus the Mechanical Engineering Skills Workshop. This one hour per week workshop familiarizes mechanical engineering students with basic practices in a laboratory environment including safety considerations, design planning, layout, fabrication, and the use of basic measuring equipment and devices to test and verify a design. The workshop is offered in the Spring semester and is graded on a Satisfactory/Unsatisfactory basis. The workshop carries no academic credit.

Sophomore

CE	205	Statics and Strength of Materials
E	225	Technical Writing and Presentation
EE	201	Introduction to Electrical Circuits
IE	204	Engineering Economics
M	203	Calculus III
M	204	Differential Equations
ME	101	Engineering Graphics
ME	200	Engineering Materials
ME	204	Dynamics
ME	215	Instrumentation Laboratory
PH	205	Electromagnetism and Optics with Laboratory

Junior

EE	212	Principles of Electrical Engineering
HS	102	The Western World in Modern Times
ME	301- 302	Thermodynamics I and II
ME	307	Solid Mechanics
ME	315	Mechanics Laboratory
ME	321	Incompressible Fluid Flow
ME	330	Fundamentals of Mechanical Design (D)
ME	344	Mechanics of Vibration

Plus 3 credit hours of a humanities elective and 300 hours of practicum

Senior

ES	415	Professional Engineering Seminar
ME	404	Heat and Mass Transfer
ME	415	Thermo/Fluids Laboratory
ME	422	Compressible Fluid Flow
ME	431- 432	Mechanical Engineering Design I (D) and II (D)

Plus 3 credit hours of a math (300 level or higher) *or* science (biology, chemistry or a 200 level or higher course in physics) elective; 3 credit hours of a design elective (D-designated ME course); 3 credit hours of a technical elective*; 3 credit hours of an engineering/mathematics analysis elective*; 6 credit hours of humanities/social science electives.*

* *Must be chosen in consultation with the student's adviser.*

The B.S.M.E. program as previously described includes two required stems of coherent course offerings: 1) Thermo/Fluid Systems, comprising ME 301,

ME 302, ME 321, ME 404, ME 415, ME 422 (17 credits) and 2) Mechanical Systems, comprising ME 200, ME 204, ME 307, ME 315, ME 330, ME 344 (17 credits). It should be noted that the required capstone design sequence ME 431- 432 (6 credits) may be taken in either one of the above stems. Also, technical and design electives are offered periodically in both thermo/fluid and mechanical systems; and the practicum experience could be in either one or both of these areas.

A.S., Mechanical Engineering

The associate's degree in mechanical engineering is not designed to be a terminal degree. It simply provides formal evidence that the student has completed about one-half of the bachelor's program. Students wishing to earn this degree must complete the first four semesters of the B.S.M.E. program. In the fourth semester EE 201 and M 204 are replaced by HS 102 and a humanities elective. All courses taken for the associate's degree are applicable toward the bachelor's degree.

Minor in Mechanical Engineering

Students wishing to minor in mechanical engineering must complete the following courses with a minimum QPR of 2.0.

ME 101 Engineering Graphics

ME 204 Dynamics

ME 301 Thermodynamics I

Plus three courses among the 300- or 400- level ME courses. Students with general interest in mechanical engineering are advised to select ME 321, ME 330 and ME 344 .

SCHOOL OF HOSPITALITY AND TOURISM

Caroline A. Dinegar, Ph.D., program director

The School of Hospitality and Tourism and Dietetics Administration offers undergraduate degrees in three areas: General Dietetics, Hotel and Restaurant Management, and Tourism Administration.*

The school is dedicated to academic excellence through study, teaching and research in the fields of hotel, restaurant, tourism and dietetics within the United States and around the world. The school provides a strong foundation for professional careers and seeks to prepare graduates for leadership, professional excellence and lifelong learning. The curriculum is designed to strengthen the student's ability to manage, to communicate and to reason in a diverse and complex workplace. Graduates of the school furnish the managerial talent needed by hotels, resorts, health care institutions, private clubs, restaurants, governmental tourism agencies, destination management firms and corporate travel companies.

Most employers now recognize and require a college education as the best preparation for an individual desiring entrance into the hospitality, dietetics or tourism industries. Employers demand that individuals with a college education not only be technically skilled but be capable of managing in a workplace that is culturally diverse and technologically advanced.

Graduates of our programs are capable of translating theory into reality, creating an atmosphere where employees are motivated to provide clients with the highest levels of quality service, and communicating with a diverse workforce and a demanding clientele.

Our students are educated to think; to make decisions; to solve problems; to be creative, flexible, concerned and thoughtful; and to see change as an opportunity and not as a threat. Such skills create a desire within people to achieve, to lead and to find new solutions to old problems.

The school's programs provide three key elements: substantive knowledge essential to the profession, skills and abilities necessary to apply professional knowledge to the field, and values relevant to long-term success in the profession.

Programs

Bachelor of Science

General Dietetics
Hotel and Restaurant Management
Hotel and Restaurant Management with Tourism Concentration
Tourism Administration

Associate in Science

Hotel and Restaurant Management

Certificates

Gastronomy and Culinary Arts
Hotel and Restaurant Management
Dietetics Management

Graduate Program

Executive Master of Science in Tourism and Hospitality Management

Practicum/Internship

Students in the School of Hospitality and Tourism will be required to complete a total of 600 hours of field experience for the associate's degree and 1,000 hours of field experience for the bachelor's degree. The practicum/internship will be administered by credentialed faculty under the direction of the program director and/or dean.

A practicum consists of 600 hours of approved field experience and carries no academic credit. The practicum will require an assessment by the supervisor and a student

report on the activity. An internship requires 400 hours of supervised work in the field plus additional academic work such as a written and/or oral report.

The Co-op Program

The school participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in a career field. For further details contact the Co-op and Internship Coordinator in the School of Hospitality and Tourism.

Student Clubs

There are numerous student professional clubs active within the School of Hospitality and Tourism: a student chapter of the Club Managers Association, the Dietetics Club and the Tourism Club. All students are encouraged to participate in these and other UNH extra-curricular activities.

Upsilon Sigma Alpha Honor Society

The honor society for the School of Hospitality and Tourism, Upsilon Sigma Alpha, recognizes students in these fields for outstanding academic achievements, meritorious service and demonstrated leadership. The society stands for Service, Wisdom and Excellence. General requirements for selection include a 3.40 GPA.

Placement

A student in the UNH School of Hospitality and Tourism may receive help in finding a position in their chosen field. Through attendance and participation in seminars, lectures and industry conventions, students have an opportunity to meet interesting and important people in the field who are industry colleagues of the school's faculty. In addition, the Career Development Office is an active placement bureau helping students to obtain hospitality-related positions during the academic year as well as assisting with pursuit of permanent positions at the time of graduation.

Professional Careers in Hospitality, Tourism and Dietetics

The following is a sampling of some of the careers available to graduates of the school's programs:

Casino Director Club Manager
Convention bureau director
Food and beverage manager
Hotel manager
Meeting/conference planner and director
Restaurant manager
Special events manager
Travel manager (industry, commerce or government)
Travel writer/journalist
Association manager
Convention center manager
Destination development specialist
Institutional food service director
Registered dietitian
Tourist bureau manager
Travel council director

Admission Criteria

An applicant for admission to a program in the School of Hospitality and Tourism must be a graduate of an approved secondary school or the equivalent. While no set high school academic program is prescribed, an applicant must meet the standard of the university entrance requirements. Applicants must present at least 15 acceptable units of satisfactory work, including nine or more units of college preparatory subjects.

Transfer Credit

The School of Hospitality and Tourism accepts transfer credits that meet established university criteria from regionally accredited junior, senior and community colleges, plus professional schools in the hospitality field.

Hospitality, Tourism and Dietetics School Core Curriculum

The three programs in the School of Hospitality and Tourism have a relationship in both the knowledge acquired and in the workplace environment. To

enhance the student's knowledge they must complete a school core curriculum consisting of the following courses:

Required Courses for Hospitality Majors:

HR	165	Introduction to Tourism and Hospitality
HR	322	Marketing for Hospitality
HR	326	Human Resource Management for Hospitality
HR	400	Leadership Theory in Hospitality
HR	401	Leadership Application in Hospitality

Required Courses for Tourism Majors:

TA	165	Introduction to Tourism and Hospitality
TA	322	Marketing for Tourism
TA	326	Human Resource Management for Tourism
TA	400	Leadership Theory in Tourism
TA	401	Leadership Application in Tourism

Required Courses for Dietetics Majors:

HR/TA	165	Introduction to Tourism and Hospitality
DI	322	Marketing for Dietetics
DI	326	Human Resource Management for Dietetics
DI	400	Leadership Theory in Dietetics
DI	401	Leadership Application in Dietetics

The University Core Curriculum

In addition to departmental requirements, students must fulfill all requirements of the university core curriculum. For further details on these requirements, see information listed earlier in this catalog.

Dietetics*

Director: Beverly Bentivegna, Associate Professor, M.Ed., Pennsylvania State University, R.D.
Assistant Professor: Georgia Chavent, M.S., Columbia University, R.D.

Health care careers are focused on nutrition and mass volume feeding in schools, universities, hospitals, residences for children and retirees, camps, community centers, transportation facilities, armed forces, industrial plants and correctional institutions. The efficient management and supervision of such an extensive array of food service systems offers a challenge to students to prepare themselves academically and practically to assume responsibilities in the dietetic and health care fields.

B.S., General Dietetics

The university's program in general dietetics is designed for the student seeking a career as a registered dietitian (R.D.). The program emphasizes administrative dietetics, which is the management of food service systems with emphasis on health-related facilities. A student must complete professional training in an approved internship program and pass an examination given by the American Dietetic Association to become a registered dietitian. Internship programs are available in hospitals, the Armed Services and various health care facilities.

Students who earn the B.S. degree in general dietetics may apply for membership in the American Dietetic Association.

Any student who has earned a bachelor's or graduate degree from another institution and who wishes to complete the requirements, need for application to a dietetics internship from the UNH program, must take a minimum of six courses at the University of New Haven.

This program has been granted approval by the American Dietetic Association Council on Education Division of Education Accreditation/Approval.

* The Dietetics program is offered in conjunction with the graduate Human Nutrition program in the Biology Department of the College of Arts and Sciences; however, it is presently housed in the School of Hospitality and Tourism in order to be near and have access to the instructional kitchen facilities.

Required Courses

A minimum total of 121 credit hours, including the university core curriculum, must be completed for the bachelor of science degree in general dietetics. The program includes the following specialty courses:

DI 200	Basic Food Preparation
DI 214	Menu Planning
DI 216	Safety and Sanitation
DI 322	Marketing for Dietetics
DI 326	Human Resource Management for Dietetics
DI 330	Dietetic Practice in Today's Society
DI 342	Food Preparation for the Health-Conscious
DI 400	Leadership Theory in Dietetics
DI 401	Leadership Applications in Dietetics
DI 405	Community and Institutional Nutrition
DI 45	Special Topics
HR 20	Hospitality Purchasing
HR 411	Hospitality and Institutional Layout and Design
BI 115	Nutrition and Dietetics
BI 121/122	General and Human Biology with Laboratory I and II
BI 261	Introduction to Biochemistry
BI 301	Microbiology with Laboratory
BI 315	Nutrition and Disease
CH 105	Introduction to General and Organic Chemistry with Laboratory
A 101	Introduction to Financial Accounting
PA 308	Health Care Delivery Systems

Hotel and Restaurant Management

Chair: C.E. Vlisides, Ph.D.

Associate Professor: C.E. Vlisides, Ph.D., University of North Texas

Instructors: Patrick B. Rowland, M.S., University of New Haven, CPA; LeRoy Sluder, M.B.A., University of New Haven

The program in Hotel and Restaurant Management includes among its teaching staff members of the industry who contribute their expertise to the classroom such as Carl Bauer, Certified Club Manager, who manages one of the city's most illustrious clubs.

To those individuals who enjoy interacting with many diverse people, seek a continuous challenge and thrive on details and deadlines, a career in hotel and restaurant management offers a variety of personal and financial rewards.

The focus of the program's curriculum is on the development of managerial skills, abilities and comperencies essential to all hospitality managers. The curriculum combines contemporary and realistic techniques. Students will learn to communicate, to lead and to adapt in a multicultural environment. The diversified knowledge necessary for the management and operation of the modern hotel, motel or restaurant requires an educational background that is grounded in both theory and application. The hotel and restaurant curriculum at UNH is designed to permit classroom theory to be applied in various hospitality settings. The mixture of courses is designed to provide a broad industry overview, as well as allow the student to specialize in operational areas. To ensure hotel and restaurant majors are well-grounded academically for a career and for life-long learning, a series of liberal arts courses are also required.

The hospitality industry demands that graduates of hotel and restaurant programs understand the needs of guests and are able to provide a personal service orientation in a global marketplace. Since every aspect of the hospitality industry is involved with or depends on people, two year-long courses in human resources management and in leadership and two half-year courses in research and marketing form the management foundation of the curriculum.

B.S., Hotel and Restaurant Management

The programs in this discipline center on conceptual and technical knowledge required in the leadership and management of modern hotels, motels, clubs and restaurants. The program emphasizes interpersonal communication skills, critical analysis, flexibility and creativity from the perspective of the manager of operations.

A student earning a bachelor of science degree in hotel and restaurant management will develop those skills, abilities and competencies essential to all hospitality leaders and managers. Students must complete 40 courses equaling 122 credit hours, a 600-hour practicum and 400 hours of internship in the industry.

Required Courses

HR 165 Introduction to Tourism and Hospitality
HR 202 Hospitality Purchasing
HR 250 Lodging Operations
HR 315 Bar and Beverage Management
HR 321 Hospitality Accounting
HR 322 Marketing for Hospitality
HR 325 Food and Labor Cost Management
HR 326 Human Resource Management for Hospitality
HR 330 Hospitality Property Management
HR 375 Hospitality Entrepreneurship
HR 400 Leadership Theory in Hospitality
HR 401 Leadership Applications in Hospitality
HR 411 Hospitality and Institutional Layout and Design
HR 412 Hospitality Law
HR 450 Advanced Cuisine Management and Technique
DI 200 Basic Food Preparation
DI 214 Menu Planning
DI 216 Safety and Sanitation
DI 342 Food Preparation for the Health-Conscious

Electives (chosen in consultation with adviser)

Concentration in Tourism

TA 166 Touristic Geography
TA 250 Tourism Dimensions in Contemporary Society
TA 345 Tourism Economics
TA 435 Conventions, Meetings and Special Events

A.S., Hotel and Restaurant Management

The A.S. program was designed using a selection of courses from the B.S. program that will provide two-year students requisite knowledge and skills needed for entry-level supervisory positions in the hotel and restaurant management career field. A two-year student can easily continue in the four-year B.S. program because all the courses in the two-year program are in the four-year program. For those students not continuing in the four-year program, the two-year program provides a sound foundation in hospitality theory and application. Students must complete 21 credits of hospitality/tourism courses and a total of 60 university credits in addition to the 600-hour industry practicum.

Required Courses:

HR 165 Introduction to Tourism and Hospitality
HR 250 Lodging Operations
HR 322 Marketing for Hospitality
HR 326 Human Resource Management for Hospitality
TA 166 Touristic Geography
TA 250 Tourism Dimensions in Contemporary Society

Plus electives that may include:

DI 200 Basic Food Preparation
DI 216 Safety and Sanitation
DI 342 Food Preparation for the Health-Conscious

* It is anticipated that the B.S. in Tourism Administration will be reintroduced and made available for student enrollment in the 2000-2001 academic year.

Hotel and Restaurant Management Certificate

The department offers a nontraditional certificate in Hotel and Restaurant Management. For information, contact the School of Hospitality and Tourism.

Tourism Administration

Coordinator: C.E. Vlisides, Ph.D., University of North Texas

Professor Emeritus: Elisabeth van Dyke, Ph.D., Columbia University

As tourism continues to be a major factor in the economy of many nations, there is a growing need for expert professionals and consultants who can provide in-depth guidance and direction for this rapidly expanding industry. Travel and tourism may indeed be the world's largest industry today, accounting for considerable percentages of the global domestic product, capital investment and consumer spending worldwide.

Located between New York and Boston, two of the most prominent U.S. tourist gateways, the University of New Haven offers students a unique vantage point from which to study tourism.

Tourism as a profession requires a knowledge of such fields as economics, finance, accounting, marketing, planning and policy development. Career possibilities in tourism include employment in attractions and outdoor commercial recreation facilities and resorts; convention, meeting and special event management; marketing and sales of travel services; government tourism marketing and planning agencies; and international and national tourism associations.

Recognizing that education extends beyond the classroom, all tourism majors must complete 1,000 hours of work experience by doing 600 hours of practicum and 400 hours of internship. Professional internships are an elective means of obtaining quality work experience. Guest lectures and field trips to conventions, trade shows and professional meetings provide excellent learning opportunities.

B.S., Tourism Administration

The program presents a balanced tourism curriculum with management skills, leadership and human resource management as well as tourism economics, planning and marketing. Global orientations are provided in courses covering international relations and international law, organization and business. Classroom theory is complemented by other learning opportunities including guest lecturers and field trips to conventions, trade shows and professional meetings. Moreover, as conditions allow, students are given opportunities to work on professional projects. This provides excellent work experience and exposure to area tourism professionals.

The B.S. degree in tourism administration provides students with the knowledge and skills necessary to compete for entry-level management or supervisory positions. The leadership management orientation of the curriculum also enables graduates to secure upward mobility.

Required Courses

A student earning a bachelor of science degree in tourism administration must complete 121 credit hours, 600 hours of practicum and 400 hours of internship. Most students complete the practicum requirement through summer employment.

In addition to the university core curriculum and other supportive management courses taught by several other departments in the university, students must take the following major courses:

TA 165 Introduction to Tourism and Hospitality
TA 166 Touristic Geography
TA 250 Tourism Dimensions in Contemporary Society
TA 322 Marketing for Tourism
TA 326 Human Resource Management for Tourism
TA 340 Tourism Planning and Policy
TA 345 Tourism Economics
TA 400 Leadership Theory in Tourism
TA 401 Leadership Applications in Tourism
TA 425 Destination Marketing, Sales and Promotion
TA 435 Conventions, Meetings and Special Events
TA 490 Special Topics

* It is anticipated that the B.S. in Tourism Administration will be reintroduced and made available for student enrollment in the 2000-2001 academic year.

Institute of Gastronomy and Culinary Arts

Director and Chef-in-Residence: Patrick Boisjot, professional baccalaureate, Lycée Hotelier de Thonon-les-Bains, France; B.S., State University of New York, Empire State College

A recent addition to the University of New Haven, the Institute of Gastronomy and Culinary Arts is housed in the School of Hospitality and Tourism. Featured among its offerings is a program leading to national certification in food handling recognized by the State of Connecticut as well as a certificate of mastery in basic techniques and theories of cooking. The institute serves as a focal point for programs designed

not only for UNH students earning academic credits, but also for food writers, restaurant owners and hobbyist cooks. Additional information is available from the School of Hospitality and Tourism, Harugari Hall.

Certificate in Gastronomy & Culinary Arts

This 12-credit certificate is a flexible, part-time program consisting of four courses. No prior experience is necessary. As a part-time student, the coursework requires an in-class time commitment of three to six hours per week.

Each course integrates practical and classroom applications. The 12 college credits earned for the certificate may be applied toward an associate's or bachelor's degree. Students are also provided with the opportunity to take the national food safety and sanitation exam and become certified.

In order to be awarded the Certificate in Gastronomy and Culinary Arts, students must complete 12 credits by enrolling in the following four courses:

DI 200 Basic Food Preparation
DI 342 Food Preparation for the Health-Conscious
HR 450 Advanced Cuisine Management and Technique
HR 493 Special Topic in Hospitality: Culinary Arts Through Classical Techniques

SCHOOL OF PUBLIC SAFETY AND PROFESSIONAL STUDIES

Thomas A. Johnson, D.Crim., dean

The School of Public Safety and Professional Studies provides educational services for students who wish to major in degree programs specifically oriented toward career paths in aviation, occupational safety and health, criminal justice, forensic science, fire science and arson investigation, corrections, paralegal studies and related programs. The school provides a broad professional education which often incorporates classroom learning with laboratory and field experience. The school attracts students of varied ages and levels of experience, from recent high school graduates to seasoned industry professionals. It also services professionals seeking programs designed to meet requirements of national and/or regional accreditations and licensures.

Graduate degree programs and certificates are available in various disciplines through the Graduate School.

Programs and Concentrations

Bachelor of Science

Air Transportation Management
Criminal Justice
- Corrections
- Investigative Services
- Juvenile and Family Justice
- Law Enforcement Administration
- Private Security
- Victim Services Administration

Fire Science
- Fire/Arson Investigation
- Fire Administration
- Fire Science Technology

Fire Protection Engineering
Forensic Science
Occupational Safety and Health
- Administration

Occupational Safety and Health Technology

Associate in Science

Aviation Science
Criminal Justice
Fire and Occupational Safety
Occupational Safety and Health Administration
Occupational Safety and Health Technology

Certificates

Fire/Arson Investigation
Fire Prevention
Forensic Computer Investigation
Hazardous Materials
Industrial Fire Protection
Information Protection and Security
Law Enforcement Science
Occupational Safety and Health
Paralegal Studies
Private Security

Graduate Programs

Master of Science

Aviation Science
Criminal Justice
Fire Science
Forensic Science
Forensic Science/Information Protection and Security
Industrial Hygiene
Occupational Safety and Health Management

Graduate Certificates

Arson Investigation
Criminal Justice/Security Management
Fire Science/Administration and Technology
Forensic Science/Advanced Investigation
Forensic Science/Criminalistics
Forensic Science/Fire Science
Forensic Science/Forensic Computer Investigation

Industrial Hygiene
Occupational Safety
Public Safety Management

Department of Criminal Justice

Chair: William Norton, J.D., Ph.D.

Professor Emeritus: David A. Maxwell, J.D., University of Miami, C.P.P.

Professors: Thomas A. Johnson, D.Crim., University of California, Berkeley; Henry C. Lee, Ph.D., New York University; William Norton, J.D., University of Connecticut, Ph.D., Florida State University; L. Craig Parker, Jr., Ph.D., State University of New York at Buffalo; Gerald D. Robin, Ph.D., University of Pennsylvania

Associate Professors: Mario T. Gaboury, Ph.D., Pennsylvania State University, J.D., Georgetown University; Howard A. Harris, Ph.D., Yale University, J.D., St. Louis University; Lynn Hunt Monahan, Ph.D., University of Oregon; James Monahan, Ph.D., Florida State University

Assistant Professor: James M. Adcock, M.P.A., Jacksonville State University

Instructor: Marilyn Miller, M.S., University of Pittsburgh

Practitioners-in-Residence: John Bailey, J.D., Columbus School of Law, Catholic University of America; William H. Carbone, M.P.A., University of New Haven, director of alternative sanctions, State of Connecticut; Nicholas A. Cioffi, J.D., University of Connecticut; Salvatore D'Amico, M.A., University of New Haven; The Hon. Michael P. Lawlor, J.D., George Washington University, Connecticut state representative; The Hon. Martin Looney, J.D., University of Connecticut; Leonard Rubin, Ph.D., SUNY at Stony Brook; George Wezner, B.S., University of New Haven

Distinguished Lecturer: Lorah Perlee, Ph.D., New York Medical College

Criminal Justice

Coordinator of Corrections: Lynn Hunt Monahan, Ph.D.
Coordinator of Investigative Services: James M. Adcock, M.P.A.
Coordinator of Juvenile and Family Justice: Lynn Hunt Monahan, Ph.D.
Coordinator of Law Enforcement Administration: William M. Norton, Ph.D., J.D.
Coordinator of Private Security : William Norton, Ph.D., J.D.
Coordinator of Victim Services Administration: Mario T. Gaboury, Ph.D., J.D.

The criminal justice system is a formal mechanism of control through which social order is maintained. The study of this system is approached in an interdisciplinary manner involving law, the physical sciences and the social sciences. Through the use of both conventional and innovative techniques, including lectures, written assignments, seminars, workshops, internships and independent research and study, an attempt is made to provide students with the opportunity to gain a wide variety of insights and experiences.

There is a full range of career opportunities available in criminal justice at the local, state and national levels. Because of its interdisciplinary approach, the study of criminal justice fills the needs of students seeking careers in teaching, research and law, and of inservice personnel seeking academic and professional advancement.

The department offers courses from the associate's to the master's level as well as certificates. Complete information about the master of science degrees in criminal justice and in forensic science and the graduate certificates is available in the Graduate School catalog.

Undergraduate criminal justice concentrations in law enforcement administration, corrections, law enforcement science, juvenile and family justice, victim services administration and private security are available in the criminal justice program. A separate program is offered in forensic science.

The Criminal Justice Club

The American Criminal Justice Association (ACJA) is a national professional and preprofessional organiza-

tion with goals that include improved technology, training and service for the benefit of the criminal justice system. UNH's local student chapter of ACJA is the Psi Omega chapter. This club offers students a variety of activities including community service as well as the opportunity to meet and work with practitioners in the field. Students also meet others with similar interest and are eligible to participate in regional and national programs and activities.

Alpha Phi Sigma–Alpha Tau Chapter

Alpha Tau is the local chapter of Alpha Phi Sigma, the National Criminal Justice Honor Society. Alpha Tau's purpose is to recognize and promote academic excellence among undergraduate and graduate students. The local chapter was formed in 1998 and embraces the full spectrum of criminal justice students from criminal justice and forensic science to pre-law and the related social sciences.

Undergraduate students who have completed 60 credit hours and at least four criminal justice courses, and who have at least a 3.4 cumulative QPR are eligible for membership. Graduate students who have a 3.4 cumulative QPR and who have completed at least 12 credit hours of graduate work, or 9 credit hours of graduate work and at least 3 additional undergraduate credit hours, are eligible for membership.

Additional information may be obtained by contacting the Alpha Tau adviser, Dr. James Monahan, in the Department of Criminal Justice.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details see "The Co-op Program" which appears earlier in this catalog or contact the Co-op coordinator in the School of Public Safety and Professional Studies.

B.S., Criminal Justice

Required Courses

Students earning the B.S. in criminal justice are required to complete at least 121 credit hours, including the university core curriculum and the common courses for criminal justice majors listed below:

CJ 100 Introduction to Criminal Justice
CJ 102 Criminal Law
CJ 201 Principles of Criminal Investigation
CJ 205 Interpersonal Relations
CJ 217 Criminal Procedure I
CJ 250 Scientific Methods in Criminal Justice
CJ 251 Quantitative Applications in Criminal Justice
CJ 311 Criminology
CJ 400 Criminal Justice Problems Seminar
CJ 498 Research Project, *or*
CJ 500A Criminal Justice Pre-Internship and
CJ 500B Criminal Justice Internship

Concentration in Corrections

This concentration is designed to prepare students for careers with federal, state, local and private correctional agencies and institutions. It is concerned with the treatment of offenders, administration, planning and research. The curriculum emphasizes law, social and behavioral sciences, and research methodology.

Students earning the B.S. in criminal justice with a concentration in corrections must complete the university core curriculum, the common courses for criminal justice majors listed above, and the following:

CJ 209 Correctional Treatment Programs
CJ 220 Legal Issues in Corrections
CJ 408-409 Correctional Counseling I and II
CJ 412 Substance Abuse and Addictive Behavior

Concentration in Investigative Services

This concentration is designed to provide an interdisciplinary educational program for those people entering law enforcement science fields, especially investigative work. In addition, it is geared toward enhancing the scientific knowledge of those people now holding investigative positions in various enforcement agencies. The curriculum emphasizes law enforcement, evidence, forensic science, and natural and physical sciences.

Students earning the B.S. in criminal justice with a

concentration in investigative services must complete the university core curriculum, the common courses for criminal justice majors listed above, and the following:

CJ 215 Introduction to Forensic Science
CJ 218 Criminal Procedure II and Evidence
CJ 303 Forensic Science Laboratory I
CJ 415 Crime Scene Investigation and Pattern Evidence
CJ 420 Advanced Investigative Techniques

Concentration in Juvenile and Family Justice

This concentration is designed to prepare students for careers with federal, state, local and private correctional agencies, and with service agencies whose mission brings them into regular contact with the justice system. The curriculum is geared to preparing service providers with knowledge of law, social and behavioral sciences as well as communication skills with children, adolescents and people of diverse cultural backgrounds.

Students earning a B.S. in criminal justice with a concentration in juvenile and family justice must complete the university core curriculum, the common courses for criminal justice majors listed above, and the following:

CJ 209 Correctional Treatment Programs
CJ 221 Juvenile Justice System
CJ 408 Correctional Counseling I
CJ 409 Correctional Counseling II
CJ 411 Victimology

Concentration in Law Enforcement Administration

This concentration prepares students for careers in federal, state and local law enforcement agencies, public and private security forces, planning agencies and other related settings. The curriculum focuses on the roles, activities and behaviors of people with regard to maintaining law and order, providing needed services, protecting life and property, and planning and research.

Students earning the B.S. in criminal justice with a concentration in law enforcement administration must complete the university core curriculum, the common courses for criminal justice majors listed above, and the following:

CJ 215 Introduction to Forensic Science
CJ 218 Criminal Procedure II and Evidence
CJ 221 Juvenile Justice System
CJ 333 Police Civil Liability
CJ 402 Police in Society

Concentration in Private Security

The concentration in private security is designed to provide those entering or now holding administrative or managerial positions in private security with the necessary skills and know-how to perform effectively and professionally. The program is interdisciplinary in nature and draws from the fields of criminal justice, forensic science, business administration, industrial engineering and the behavioral sciences.

Students earning the B.S. in criminal justice with a concentration in private security must complete the university core curriculum, the common courses for criminal justice majors listed above, and the following:

CJ 105 Introduction to Security
CJ 203 Security Administration
CJ 226 Industrial Security
CJ 306 Security Problems Seminar
CJ 410 Legal Issues in Private Security

Concentration in Victim Services Administration

This concentration provides students with an interdisciplinary, practice-oriented educational program. It is designed to prepare graduates for entry into a wide variety of positions in law enforcement, criminal justice, the courts, corrections, victim services programs as well as professional settings involving work with victims of crime, their families and the community-at-large. The curriculum encourages a broad-based training experience focusing on the enhancement of the appropriate involvement of victims in the justice system and the provision of services to victims and survivors.

Students earning the B.S. in criminal jusrice with a concentration in victim services administration must complete the university core curriculum, the common

courses for criminal justice majors listed above, and the following:

CJ 210 Ethnic and Gender Issues in Criminal Justice
CJ 221 Juvenile Justice System
CJ 315 Domestic Violence
CJ 411 Victimology
CJ 413 Victim Law and Service Administration

A.S., Criminal Justice

Students completing the first two years of the bachelor of science degree program in criminal justice with the law enforcement administration concentration or the corrections concentration (61 credit hours) are eligible to receive the associate in science degree. Interested students should contact their adviser.

Minor in Criminal Justice

To minor in criminal justice, students must complete 18 credit hours of criminal justice courses, including CJ 100 Introduction to Criminal Justice.

Forensic Science

Director: Howard A. Harris, Ph.D., J.D.

B.S., Forensic Science

Forensic science is a broad, interdisciplinary field in which biological and physical science methods are used to analyze and evaluate physical evidence related to matters of criminal and civil law. The objective of the program is to provide an appropriate education and scientific background to men and women planning careers as physical evidence examiners in crime laboratories. The curriculum is also appropriate for individuals currently working in forensic science laboratories and would be valuable for those interested in related areas whose professional work requires in-depth knowledge of science and scientific investigation methods. The curriculum provides sufficient flexibility to allow students to focus their studies in chemistry or in biology.

Required Courses

Students earning the B.S. in forensic science must complete 136 credit hours, including the university core curriculum and the following courses:

CJ 100	Introduction to Criminal Justice I
CJ 102	Criminal Law
CJ 201	Principles of Criminal Investigation
CJ 205	Interpersonal Relations
CJ 215	Introduction to Forensic Science
CJ 403-404	Advanced Forensic Science Laboratory I and II
CJ 415	Crime Scene Investigation and Pattern Evidence
CJ 416	Seminar in Forensic Science
CJ 502	Forensic Science Internship, *or* CJ 498 Research Project
BI 121-122	General and Human Biology with Laboratory I and II
BI 304	Immunology with Laboratory, *or* M 203 Calculus III
BI 311	Genetics and Molecular Biology with Laboratory, *or* CH 331/333 Physical Chemistry I with Laboratory
BI 461	Biochemistry with Laboratory, *or* CH 332/334 Physical Chemistry II with Laboratory
CH 115-116	General Chemistry I and II
CH 117-118	General Chemistry Laboratory I and II
CH 201-202	Organic Chemistry I and II
CH 203-204	Organic Chemistry Laboratory I and II
CH 211	Quantitative Analysis with Laboratory
CH 221	Instrumental Methods of Analysis with Laboratory
CH 341	Synthetic Methods in Chemistry
CO 100	Human Communication
CS 107	Introduction to Data Processing
P 111	Introduction to Psychology, *or* SO 113 Sociology
PH 150	Mechanics, Heat and Waves with Laboratory
PH 205	Electromagnetism and Optics with Laboratory

One of the following sequences:

M 115	Pre-Calculus and M 117 Calculus I; *or* M 117-118 Calculus I and II

Electives are chosen through discussion with adviser.

Criminal Justice Certificates

Adviser: William Norton, Ph.D., J.D.

The department offers certificates in law enforcement science and private security. Students must complete 18 credit hours of required courses to earn a certificate. Credits earned for a certificate may be applied toward the requirements for a degree program at a later date.

Law Enforcement Science Certificate

This certificate is designed to provide the fundamentals of criminal investigation techniques and procedures, particularly for those involved in or planning to enter investigative positions in law enforcement agencies in both the private and public sectors. All students are required to take 18 credit hours, including the courses listed below:

CJ 201 Principles of Criminal Investigation
CJ 215 Introduction to Forensic Science
CJ 227 Fingerprints with Laboratory
CJ 303-304 Forensic Science Laboratory I and II
CJ 415 Crime Scene Investigation and Pattern Evidence

Private Security Certificate

This certificate is a concentrated program of study in management security systems for private business and industry. All students are required to take 18 credit hours, including the courses listed below:

CJ 105 Introduction to Security
CJ 203 Security Administration
CJ 226 Industrial Security
CJ 410 Legal Issues in Private Security
FS 204 Fire Investigation I
SH 100 Safety Organization and Management

Forensic Science Certificates

Forensic Computer Investigation Certificate

Adviser: Thomas A. Johnson, D. Crim.

This certificate is designed for those professionals who wish to enhance their knowledge and skills in forensic computer investigation. Students interested in enrolling in the courses in this certificate must obtain permission of the instructor and/or the certificate adviser prior to registration. Alternate course selections may be permitted with the permission of the certificate adviser. Four courses (12 credits) are required for completion of the certificate.

CJ 520 Computer Crime: Legal Issues and Investigative Procedures
CJ 524 Network Security, Data Protection and Telecommunications

Plus two of the following, with approval of adviser:

CJ 201 Principles of Criminal Investigation
CJ 217 Criminal Procedure I
CJ 218 Criminal Procedure II and Evidence
CJ 415 Crime Scene Investigation and Pattern Evidence
CJ 420 Advanced Investigative Techniques
CJ 450 Special Topics
CJ 498 Research Project
CJ 522 Computers, Technology and Criminal Justice Information Management Systems
CJ 523 Internet Vulnerabilities and Criminal Activity

Information Protection and Security Certificate

Adviser: Thomas A. Johnson, D.Crim.

This certificate is designed to prepare individual for assuming the responsibilities of protecting their agency or corporate information systems. The basics of information systems security as well as legal issues and cyber response strategies will be reviewed. Computer gaming simulations as well as on-line attack and defense techniques will be presented for student assignments. Five courses (15 credits) are required for completion of the certificate.

CJ 525 Information Systems Threats, Attacks and Defenses
CJ 526 Firewall and Secure Enterprise Computing
CJ 527 Internet Investigations and Audit-Based Computer Forensics
CJ 528 Computer Viruses and Malicious Code
CJ 529 Practical Issues in Cryptography

Department of Professional Studies

Professors: Brad T. Garber, Ph.D., University of California, Berkeley

Associate Professor: Howard J. Cohen, Ph.D., University of Michigan; David P. Hunter, M.P.A., University of New Haven; Martin J. O'Connor, J.D., University of Connecticut

Assistant Professor: Sorin Iliescu, M.S., University of New Haven; Robert E. Massicotte, Jr., M.S., University of New Haven

Visiting Professor: Ralph Shain, Ph.D., Hebrew University, Israel

Lecturer: George D. Lainas, M.B.A., University of New Haven

Practitioners-in-Residence: Hamdy M. Balba, Ph.D., University of California, Berkeley; Mark B. Haskins, M.S., University of New Haven; Robert G. Sawyer, III, M.S., University of New Haven; Ronald Tsolis, B.S., University of New Haven

The department of professional studies offers several degree programs for students interested in specific employment-related areas: aviation science, air transportation management, fire science (technology, administration and fire/arson investigation) fire protection engineering and occupational safety and health (administration and technology). A number of certificates are offered in these fields, as well as a certificate in paralegal studies and minors in legal/public affairs.

Aviation

Director: David P. Hunter, M.P.A.

Flight Operations: Ronald Tsolis, B.S.

The university's aviation programs prepare students for employment in many aspects of the aviation industry. Trained professionals with both technical and managerial skills are employed as commercial, private or general flight and service personnel as well as in the manufacturing sector of this dynamic field. The aviation department offers a number of choices in its curriculum for students interested in careers in aviation.

The program leading to the associate's degree in aviation science provides students with a two-year program that consists of the classroom instruction in various aspects of aviation plus the choice of a concentration in either business administration or arts and sciences. Each concentration consists of a group of the basic core courses required for future study in that field.

Following completion of the associate's degree, students may continue study for a bachelor's degree in air transportation management or in some other program that meets individual career objectives.

The bachelor of science degree in air transportation management provides students with the knowledge and skills contained in a strong foundation of aviation management courses and related subjects that are required of pilots and executives in the aviation industry.

B.S., Air Transportation Management

Students earning the B.S. in air transportation management must complete 122 credit hours including the university core curriculum, electives, the required courses listed below plus additional required courses (12 credit hours) selected in consultation with the faculty adviser.

Required Courses

AE 100 Aviation Science–Private
AE 110 Aviation Meteorology
AE 120 Foundations of Aviation
AE 130 Aviation Science–Commercial
AE 140 Concepts of Aerodynamics
AE 200 Aviation Science–Instrument
AE 210 Gas Turbine Powerplants
AE 230 Flight Instructor Seminar
AE 320 Air Traffic Control
AE 400 Airport Management
AE 410 Corporate Aviation Management
AE 420 Airline Management
AE 430 Aviation Safety Seminar
AE 440 Aviation Law
A 101 Introduction to Financial Accounting
A 102 Introduction to Managerial Accounting
CS 107 Introduction to Data Processing

EC 133-134	Principles of Economics I and II
M 109	Intermediate Algebra
M 115	Pre-Calculus

A.S., Aviation Science

A total of 64 credit hours, including the university core curriculum for the associate's degree program, is required for the associate in science degree in aviation science. The program is designed to be completed in two years.

Required Courses

In addition to the courses listed below, students will select an area of concentration in consultation with the director of aviation programs in either business administration or arts and sciences. This concentration will prepare students for the continuation of their education toward a bachelor's degree to meet their individual needs and career objectives.

AE 100	Aviation Science–Private
AE 110	Aviation Meteorology
AE 130	Aviation Science–Commercial
AE 140	Concepts of Aerodynamics
AE 200	Aviation Science–Instrument
AE 210	Gas Turbine Powerplants
AE 230	Flight Instructor Seminar
EC 133-134	Principles of Economics I and II

Plus the university associate's degree program core courses.

Fire Science

Director: Robert E. Massicotte, Jr., M.S.

The United Srates continues to be among those countries worldwide which suffer the highest degree of destruction to life and property from fire. The arson/fraud fire problem continues to contribute to these statistics at an alarming rate.

Concern over this unnecessary loss of life and property has triggered a rapidly growing need for professionals in fire science. The municipal fire service is only one part of this demand for individuals with specialized education in this multidisciplined field. Career opportunities in the public sector include municipal firefighters, fire inspectors, fire investigators, fire technicians and fire protection engineers. Private sector careers include industrial firefighters, fire protection specialists, fire protection engineers, fire investigators and loss control consultants. Government, industry, fire equipment manufacturers and vendors, and the insurance industry are all potential employers.

The University of New Haven offers three undergraduate degrees and four certificate programs designed for those individuals entering the exciting field of fire science. A combination of classroom lectures, laboratory sessions, case studies and field trips are utilized to give the student the broadesr possible exposure in this area of study. Internships are used to allow the student to obtain real-life work experience in this specialized field.

The university also offers graduate certificate programs and a master's degree in fire science for those completing their bachelor's degrees.

Fire Science Club

The Fire Science Club is the campus student activities organization for those students with interests in fire science and related fields. This very active organization organizes field trips, fire safety and substance abuse programs along with other activities, both on and off campus, throughout the school year.

Student Branch of the Connecticut Valley Chapter of SFPE

The Student Branch of the Connecticut Valley Chapter of the Society of Fire Protection Engineers is the professional society on campus for fire science students. The Student Branch works closely with the Fire Science Club to provide programs and field trips with a strong technical basis.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine their education with practical, paid work experience in their career field. For further details, see "The Co-op Program" which appears earlier in this

catalog or contact the Co-op coordinator for the School of Public Safety and Professional Studies.

B.S., Fire Science

The bachelor of science in fire science is offered with a choice of three concentrations to allow the student to major in fire science and specialize in an area of interest. The concentration areas are Fire/Arson Investigation, Fire Administration and Fire Science Technology.

Required Courses

Students earning the B.S. in fire science are required to complete at least 128 credit hours including the university core curriculum and the common courses for fire science listed below, some of which fulfill requirements of the university core curriculum.

FS 102 Principles of Fire Science Technology
FS 201 Essentials of Fire Chemistry with Laboratory
FS 203 Fire and Casualty Insurance
FS 207 Fundamentals of Fire Prevention
FS 301 Building Construction Codes and Standards
FS 302 Chemistry of Hazardous Materials
FS 303 Process and Transportation Hazards
FS 304 Fire Detection and Control
FS 305 Fire Detection and Control Laboratory
FS 311 Fire Protection Fluids and Systems
FS 312 Fire Protection Fluids and Systems Laboratory
FS 325 Fire/Life Safety Codes
FS 404 Special Hazards Control
FS 497 Research Project
FS 501 Internship
CH 115 General Chemistry I
CH 117 General Chemistry I Laboratory
CS 107 Introduction to Data Processing

Plus electives chosen with the adviser.

Concentration in Fire/Arson Investigation

This concentration is designed to prepare students for careers in fire investigation, arson/fraud detection and code enforcement in both the public and private sectors. The curriculum provides the educational background required to determine the cause and origin of fires as well as an in-depth study of the laws regarding fire investigations and evidence collection. Students choosing this concentration will complete the requirements for a minor in criminal justice. Students earning the B.S. in fire science with a concentration in fire/arson investigation must complete 128 credit hours including the university core curriculum, the common courses for fire science majors listed above and the courses listed below, some of which fulfill requirements of the university core curriculum.

FS 106 Emergency Scene Operations
FS 204 Fire Investigation I
FS 313 Fire Investigation II
FS 314 Fire Investigation II Laboratory
FS 408 Fire Protection Law
FS 409 Arson for Profit
CJ 100 Introduction to Criminal Justice
CJ 102 Criminal Law
CJ 201 Principles of Criminal Investigation
CJ 215 Introduction to Forensic Science
CJ 217 Criminal Procedure I
CJ 218 Criminal Procedure II and Evidence
CJ 221 Juvenile Justice System, *or*
CJ 415 Crime Scene Investigation and Pattern Evidence
M 109 Intermediate Algebra, *or*
M 127 Finite Mathematics
P 111 Introduction to Psychology
P 336 Abnormal Psychology

Concentration in Fire Administration

This concentration is designed to prepare students for careers in municipal, private or industrial fire departments. The curriculum provides the educational background to advance through the ranks and become the future leaders of the fire service.

Students earning the B.S. in fire science with a concentration in fire administration must complete a minimum of 128 credit hours including the university core curriculum, the common courses for fire science majors listed above and the courses listed below, some of which fulfill requirements of the university core curriculum.

FS 105 Municipal Fire Administration
FS 106 Emergency Scene Operations
FS 204 Fire Investigation I
FS 313 Fire Investigation II
FS 314 Fire Investigation II Laboratory

FS 405 Fireground Management
FS 408 Fire Protection Law
CJ 105 Introduction to Security
M 109 Intermediate Algebra, *or*
M 127 Finite Mathematics
P 111 Introduction to Psychology
Plus one Physics Elective
SH 100 Safety Organization and Management
SH 110 Accident Conditions and Controls
SH 200 Elements of Industrial Hygiene

Concentration in Fire Science Technology

This concentration focuses on the technological aspects of fire science. Fire control by design, construction and fixed fire suppression systems is stressed. A combination of fire science and engineering courses is used to prepare the student to apply basic engineering principles to the fire problem. Fire prevention and code compliance are stressed in this program. Careers in this field are mainly in the private sector; however, these skills are becoming more important in all areas, as the fire service prepares to meet the technical challenges of the future.

Students earning the B.S. in fire science with a concentration in fire science technology must complete 129 credit hours including the university core curriculum, the common courses for fire science majors listed above and the courses listed below, some of which fulfill requirements of the university core curriculum.

FS 308 Industrial Fire Protection I
FS 309 Industrial Fire Protection II
FS 425 Fire Protection Plan Review
FS 460 Fire Hazards Analysis
CE 205 Statics and Strength of Materials
CE 306 Hydraulics
M 117 Calculus I
M 118 Calculus II
ME 204 Dynamics
ME 301 Thermodynamics I
MG 115 Fundamentals of Management
PH 150 Mechanics, Heat and Waves with Laboratory
PH 205 Electromagnerism and Optics with Laboratory
SH 100 Safety Organization and Management
SH 110 Accident Conditions and Controls
SH 200 Elements of Industrial Hygiene

B.S., Fire Protection Engineering

Coordinator: Sorin Iliescu, M.S.

The role of a fire protection engineer is to safeguard life and property from the devastating effects of fire and explosions by applying sound, multidisciplined engineering principles to the fire protection problem. Through a combination of engineering and fire science courses, students learn how to design, construct and install fire protection systems which prevent or minimize potential losses from fire, water, smoke or explosions.

Graduates of the fire protection engineering program will be qualified to design, evaluate or test systems responsible for the reduction of fire losses. They will also be prepared to analyze the fire protection defenses of various structures and operations, and recommend cost effective methods of improving the level of protection that is provided.

Careers in this field may be in the private or public sector. Government, insurance, industry, manufacturers and consultants are prospective employers of fire protection engineers.

Required Courses

Students earning the B.S. in fire protection engineering must complete 130 credit hours including the university core curriculum and the courses listed below, some of which fulfill requirements of the university core curriculum.

FS 102 Principles of Fire Science Technology
FS 201 Essentials of Fire Chemistry with Laboratory
FS 203 Fire and Casualty Insurance
FS 207 Fundamentals of Fire Prevention
FS 301 Building Construction Codes and Standards
FS 303 Process and Transportation Hazards
FS 304 Fire Detection and Control
FS 305 Fire Detection and Control Laboratory
FS 308 Industrial Fire Protection I
FS 309 Industrial Fire Protection II
FS 311 Fire Protection Fluids and Systems
FS 312 Fire Protection Fluids and Systems Laboratory
FS 325 Fire/Life Safety Codes

FS 404 Special Hazards Control
FS 425 Fire Protection Plan Review
FS 450 Fire Protection Heat Transfer
FS 460 Fire Hazards Analysis
CE 205 Statics and Strength of Materials
CE 306 Hydraulics
CH 115 General Chemistry I
CH 117 General Chemistry I Laboratory
CH 116 General Chemistry II
CH 118 General Chemistry II Laboratory
CS 107 Introduction to Data Processing
ES 107 Introduction to Engineering
IE 204 Engineering Economics
M 117 Calculus I
M 118 Calculus II
M 203 Calculus III
M 204 Differential Equations
ME 200 Engineering Materials
ME 204 Dynamics
ME 301 Thermodynamics I
PH 150 Mechanics, Heat and Waves with Laboratory
PH 205 Electromagnetism and Optics with Laboratory

Plus electives chosen with the adviser.

A.S., Fire and Occupational Safety

This two-year associate in science degree offers students a well-rounded, basic program in the fields of occupational safety and fire science.

Many students continue on to earn their bachelor's degrees in occupational safety or fire science. The program is specifically designed for the individual who wishes to enter the private sector in the fields of occupational safety and fire protection.

Career options in this field include industry and insurance.

Required Courses

Students earning the A.S. in fire and occupational safety must complete 62 credit hours including the university core curriculum for associate's degree programs and the courses listed below, some of which fulfill requirements of the university core curriculum:

FS 102 Principles of Fire Science Technology
FS 201 Essentials of Fire Chemistry with Laboratory
FS 203 Fire and Casualty Insurance
FS 207 Fundamentals of Fire Prevention
FS 303 Process and Transportation Hazards
FS 308 Industrial Fire Protection I
FS 309 Industrial Fire Protection II
CH 115 General Chemistry I
CH 117 General Chemistry I Laboratory
CS107 Introduction to Data Processing
M 109 Intermediate Algebra, *or*
M 127 Finite Mathematics
SH 100 Safety Organization and Management
SH 110 Accident Conditions and Controls
SH 200 Elements of Industrial Hygiene

Plus electives chosen with the adviser

Minor in Fire Science

Students wishing to minor in fire science should contact the director of the program. A minimum of 19 credit hours is required. The courses listed below are required unless a substitution is approved by the director of fire science.

Required Courses

FS 102 Principles of Fire Science Technology
FS 201 Essentials of Fire Chemistry with Laboratory
FS 204 Fire Investigation I
FS 207 Fundamentals of Fire Prevention
FS 301 Building Construction Codes and Standards
FS 303 Process and Transportation Hazards

Fire Science Certificates

The fire science department offers certificates in fire/arson investigation, fire prevention, industrial fire protection and hazardous materials. To earn a certificate, students must complete between 18 and 19 credit hours. Credits earned for a certificate may be applied to an associate's or bachelor's degree in fire science.

Fire/Arson Investigation Certificate

The fire/arson investigation certificate is designed to provide individuals in either the public or private sector with the fundamentals required to determine the cause and origin of fires. Investigative techniques

and arson determination are included in this certificate program. Students are required to complete 19 credit hours, including the courses listed below.

Required Courses

FS 102 Principles of Fire Science Technology
FS 203 Fire and Casualty Insurance
FS 204 Fire Investigation I
FS 313 Fire Investigation II
FS 314 Fire Investigation II Laboratory
FS 408 Fire Protection Law
FS 409 Arson for Profit

Fire Prevention Certificate

The Fire Prevention certificate is designed to provide the fundamentals of fire protection and prevention to the individual interested in fire inspection and/or code compliance. The certificate is applicable to both the public and private sectors with an emphasis on property loss control. Students are required to complete 19 credit hours, including the courses listed below.

Required Courses

FS 102 Principles of Fire Science Technology
FS 201 Essentials of Fire Chemistry with Laboratory
FS 207 Fundamentals of Fire Prevention
FS 303 Process and Transportation Hazards
FS 325 Fire/Life Safety Codes
FS 404 Special Hazards Control

Industrial Fire Protection Certificate

The industrial fire protection certificate is designed to provide the individual interested in industrial property loss control with the fundamentals related to this field. While focusing on the private sector, these principles are equally important to those in the public sector who interact with those responsible for the protection of commercial and industrial properties. Students are required to complete 18 credit hours, including the courses listed below.

Required Courses

FS 102 Principles of Fire Science Technology
FS 203 Fire and Casualty Insurance
FS 207 Fundamentals of Fire Prevention
FS 308 Industrial Fire Protection I
FS 309 Industrial Fire Protection II
FS 404 Special Hazards Control

Hazardous Materials Certificate

The hazardous materials certificate is designed to provide the fundamentals required for dealing with the manufacture, storage, handling and shipping of hazardous materials. The principles covered by this certificate are equally appropriate to the public and private sectors. Students must complete 19 credit hours for this certificate.

Required Courses

FS 102 Principles of Fire Science Technology
FS 201 Essentials of Fire Chemistry with Laboratory
FS 302 Chemistry of Hazardous Materials
FS 303 Process and Transportation Hazards
PH 303 Radioactivity and Radiation
SH 200 Elements of Industrial Hygiene

The Institute of Law and Public Affairs

Director: Caroline A. Dinegar, Ph.D.

The Institute of Law and Public Affairs has been established to provide undergraduates with specific training in the areas of the paralegal profession, public policy and public affairs. Students with an undergraduate major in any of the schools of the university may attain paraprofessional status in legal affairs or public affairs by completing a minor in the Institute. The term paraprofessional applies to those with special training in a professional field but who do not yet possess the terminal degree normally required in the profession. In many instances, paraprofessional status is a step toward the accomplishment of the final degree.

Minor in Legal Affairs

The legal affairs minor in the Institute of Law and Public Affairs prepares students for positions as office managers, administrative assistants, legal investigators,

public policy research assistants, public policy library assistants and legislative researchers in private and public law firms and governmental agencies. Students acquire specific skills which will enable them to do important legal work under the supervision of practicing attorneys. The legal affairs minor also prepares students for positions and clerkships in the law libraries of the state. Courses are selected in consultation with a faculty adviser.

Minor in Public Affairs

The public affairs minor in the Institute of Law and Public Affairs is directed towards providing training for civil service positions at all levels of government. The goal of such training is to provide more effective public administrators and to introduce creativity into the profession of public service. The public affairs minor will take a problem-solving approach to the discipline as students will be conducting basic, in-depth research on problems of governmental agencies. Students in this minor will be able to develop valuable insights into the nature of the public policy process from the vantage point of the bureaucracy. Courses are selected in consultation with a faculty adviser.

Paralegal Studies Certificate

A certificate in paralegal studies is issued to students who complete 18 credit hours of paralegal courses. The required following courses.

Required Courses

PS 238 Legal Procedure I
PS 240 Legal Bibliography and Resources (prerequisite for PS 440)
PS 440 Legal Research

Plus nine additional credit hours from the courses in the Institute of Law and Public Affairs. Institute courses are listed under Political Science and designated by a symbol (†) in the course descriptions section.

Occupational Safety and Health

Director: Brad T. Garber, Ph.D.

Coordinator: Howard J. Cohen, Ph.D.

In recent years, the global community has become painfully aware of the importance of safety procedures and precautions in our everyday survival: the accidental release of lethal gases in India and the United States; the shuttle Challenger disaster; the cyanide deaths from altered Tylenol capsules, to mention only a few cases. Clearly, safety decision making has been brought to the forefront of corporation management. No employer today can afford to relegate safety to a minor role in the organizational hierarchy.

This great interest in safety issues has generated a significant demand for professional practitioners in the field. Industry, retailing, commerce, communications, construction and labor unions, as well as local, state and federal governments, need competent safety specialists.

The demands placed upon the safety professional require a broad background in chemistry, physics, engineering, psychology and biology as well as specific knowledge in the safety sciences. Our undergraduate programs draw upon the resources of the entire university to educate students in each of these disciplines. In addition to required courses, students choose from among a diversified offering of restricted and free electives with a balance of courses designed to meet the needs and interests of individual students. Upon graduation, our students have received the comprehensive education needed to become successful professionals in occupational safety and health.

In addition to the four-year bachelor of science programs in occupational safety and health administration and technology, the university also offers two-year associate's degree programs and an occupational safety and health certificate. At the graduate level, several programs are offered which include a master of science in occupational safety and health management, a master of science in industrial hygiene and two graduate certificates.

The Co-op Program

The department participates in the cooperative education program (Co-op) which enables students to combine practical, paid work experience in their career field with college education. For further details see "The Co-op Program" which appears earlier in this catalog or contact the co-op coordinator for the School of Public Safety and Professional Studies.

B.S., Occupational Safety and Health Administration

A group of degrees is offered in the field of occupational safety and health administration. These programs place less emphasis on the technical areas, but broaden the scope of the program into the areas of management and decision-making required to give students the broad-based outlook necessary to direct safety functions.

In addition to the requirements for the A.S. degree as shown below, bachelor's candidates must complete the university core curriculum and the following courses, for a combined total of 123 credit hours:

Required Courses

FS 308-309	Industrial Fire Protection I and II
SH 400	Occupational Safety and Health Legal Standards
SH 401	Industrial Hygiene Measurements
BI 121-122	General and Human Biology with Laboratory I and II
E 220	Writing for Business and Industry
E 230	Public Speaking and Group Discussion
FS 208	Instructor Methodology
FS 304	Fire Detection and Control
IE 204	Engineering Economics, *or* IE 414 Engineering Management
PH 303	Radioactivity and Radiation

Plus 12 additional credit hours of restricted electives, a science methodology elective, a literature/philosophy elective, an art/music/theatre elective and 3 credit hours of unrestricted electives.

B.S., Occupational Safety and Health Technology

Both associate's and bachelor's degrees are offered in the field of occupational safety and health technology. These degree programs provide strong technical preparation with courses in calculus, chemistry, physics, biology and other disciplines related to the evaluation and resolution of complex safety problems.

In addition to the requirements for the A.S. degree as shown below, bachelor's candidates also must complete 132 credit hours, which includes the university core curriculum and the following courses:

Required Courses

CH 201	Organic Chemistry I
CH 203	Organic Chemistry I Laboratory
FS 308-309	Industrial Fire Protection I and II
SH 400	Occupational Safety and Health Legal Standards
SH 401	Industrial Hygiene Measurements
BI 121-122	General and Human Biology with Laboratory I and II
FS 304	Fire Detection and Control
IE 303	Cost Control
IE 348	Manufacturing Processes
M 117-118	Calculus I and II
PH 303	Radioactivity and Radiation
SO 113	Sociology

Plus 9 credit hours of restricted electives, a science methodology elective, a literature/philosophy elective and an art/music/theatre elective.

A.S., Occupational Safety and Health Administration

Students earning the A.S. in occupational safety and health administration must complete 64 credit hours including the courses listed below:

Core Courses

CH 105	Introduction to General and Organic Chemistry with Laboratory
CS 107	Introduction to Data Processing
E 105	Composition
E 110	Composition and Literature

HS 102 The Western World in Modern Times
M 127 Finite Mathematics
P 111 Introduction to Psychology

Required Courses

SH 100 Safety Organization and Management
SH 110 Accident Conditions and Controls
SH 200 Elements of Industrial Hygiene
FS 106 Emergency Scene Operations
FS 201 Essentials of Fire Chemistry with Laboratory
EN 101 Introduction to Environmental Science
EN 102 Environmental Science Laboratory
CJ 105 Introduction to Security
M 228 Elementary Statistics
SO 113 Sociology

Plus 6 credit hours of unrestricted electives and an arts elective.

A.S., Occupational Safety and Health Technology

Students earning the A.S. degree in occupational safety and health technology must complete 67 credit hours including the courses listed below:

Core Courses

CH 115 General Chemistry I
CH 117 General Chemistry I Laboratory
CS 107 Introduction to Data Processing
E 105 Composition
E 110 Composition and Literature
HS 102 The Western World in Modern Times
M 115 Pre-Calculus
P 111 Introduction to Psychology

Required Courses

SH 100 Safety Organization and Management
SH 110 Accident Conditions and Controls
SH 200 Elements of Industrial Hygiene
FS 201 Essentials of Fire Chemistry with Laboratory
CH 116 General Chemistry II
CH 118 General Chemistry II Laboratory
CJ 105 Introduction to Security
IE 204 Engineering Economics, *or* IE 414 Engineering Management
M 228 Elementary Statistics
PH 103-104 General Physics I and II with Laboratory

Plus 6 credit hours of unrestricted electives and an arts elective.

Occupational Safety and Health Certificate

Coordinator: Howard J. Cohen, Ph.D.

The department offers an occupational safety and health certificate for which students must complete 18 credit hours. This program of study covers the fundamentals of on-the-job safety and health as well as the requirements of OSHA regulations. These courses provide an introduction to dealing with problems typically confronted by safety professionals.

Required Courses

FS 308 Industrial Fire Protection I
SH 100 Safety Organization and Management
SH 110 Accident Conditions and Controls
SH 200 Elements of Industrial Hygiene
SH 400 Occupational Safety and Health Legal Standards
SH 401 Industrial Hygiene Measurements

COURSES

Course descriptions are arranged alphabetically by the course prefix code letters as listed below. For the purpose of brevity, course descriptions do not follow traditional rules of grammar and may consist of sentence fragments.

A

A Accounting
AE Aviation
AT Art/Visual Arts

B

BA Business Administration
BI Biology

C

CE Civil Engineering
CEN Computer Engineering
CH Chemistry
CJ Criminal Justice
CM Chemical Engineering
CO Communication
CS Computer Science

D

DH Dental Hygiene
DI Dietetics

E

E English
EC Economics
EE Electrical Engineering
EN Environmental Science
ES Engineering Science

F

FE Freshman Experience
FI Finance
FR French
FS Fire Science

G

GR German

H

HR Hotel & Restaurant Management
HS History
HU Humanities

I

IB International Business
IE Industrial Engineering

J

J Journalism

L

LA Business Law
LG Logistics

M

M Mathematics
ME Mechanical Engineering
MG Management
MK Marketing
MM Multimedia
MR Marine Biology
MU Music

P

P Psychology
PA Public Management
PH Physics
PL Philosophy
PS Political Science

Q

QA Quantitative Analysis

R

RU Russian

S

SC Science
SH Occupational Safety & Health
SO Sociology
SP Spanish
SW Social Welfare

T

T Theatre Arts
TA Tourism & Hospitality Administration

ACCOUNTING

A 101 Introduction to Financial Accounting
Deals primarily with reporting the financial results of operations and financial position to investors, managers and other interested parties. Emphasizes the role of accounting information in decision making. 3 credit hours.

A 102 Introduction to Managerial Accounting
Prerequisite: A 101. *Open only to nonaccounting majors. Accounting and Finance majors take A112.* The application of accounting in relation to current planning and control, evaluation of performances, special decisions and long-range planning. Stress is on cost analysis. Additional topics include income tax planning, product costing and quantitative techniques. 3 credit hours.

A 112 Introductory Accounting II
Prerequisite: A101. This course is prerequisite to all subsequent courses in accounting. A fundamental examination of the concepts, principles and procedures embodied in the financial accounting system. Emphasis will be placed on the preparation of financial statements for service rendering and merchandising business concerns through the application of financial accounting principles. Topics include: stockholder's equity, dividends, cash-flow statement and bonds payable. 3 credit hours.

A 220 Intermediate Financial Accounting I
Prerequisite: A 112. A rigorous examination of financial accounting theory and practice applicable to the corporate form of business organization. With an emphasis on reporting corporate financial status and results of operations, the course will include: the principles governing and the procedures for implementing accounting valuations for revenue, expense, gain, loss, current assets and deferred charges. 3 credit hours.

A 221 Intermediate Financial Accounting II
Prerequisite: A 220. Continues the emphasis on corporate financial reporting established in A 220. The principles and procedures applicable to accounting valuations for current liabilities, long-term liabilities, deferred credits and stockholder's equity are examined. Special attention is directed to preparing the cash-flow statement. 3 credit hours.

A 222 Intermediate Financial Accounting III
Prerequisite: A 221. Advanced topics include income tax allocation, pensions and leases, accounting changes, price-level changes, installment sales and consignments, and revenue recognition. 3 credit hours.

A 223 Cost Accounting I
Prerequisite: A 112. An in-depth examination of the accounting principles and procedures underlying the determination of product costs for manufacturing concerns. Emphasis on job order costing systems. Other topics are: budgets, standard costing and CVP analysis. 3 credit hours.

A 224 Cost Accounting II
Prerequisite: A 223. A continuation of product cost determination with an emphasis on process costing systems. Other topics are: joint and by-product costs, transfer prices, segment evaluation, and inventory management. 3 credit hours.

A 225 Advanced Managerial Accounting
Prerequisite: A 224. A capstone course for managerial accounting. Topics include: advanced product costing techniques, behavioral impact of accounting reports, SEC accounting and current developments in managerial accounting. 3 credit hours.

A 331 Advanced Financial Accounting I
Prerequisite: A 221 and junior standing. Advanced topics in financial reporting, including partnership accounting, consolidations, cost and equity methods, and purchase versus pooling methods. 3 credit hours.

A 332 Advanced Financial Accounting II
Prerequisite: A 221 and junior standing. A continuation of advanced financial accounting topics introduced in A 331. Coverage includes: SEC requirements, not-for-profit accounting, trusts and estates, and bankruptcy. 3 credit hours.

A 333 Auditing and Reporting Principles
Prerequisite: A 222 and junior standing. A general examination of the role and function of the independent auditor in the performance of the attest function. Emphasis will be placed on current auditing pronouncements, the audit report, statistical sampling, evaluation of internal control and the determination of the scope of an audit. Rules and standards of compilation and review reports are presented. 3 credit hours.

A 334 Auditing Procedures
Prerequisite: A 333. An examination and evaluation of the detailed procedures associated with auditing accounts related to a firm's financial position and operating results. An evaluation and documentation of internal control procedures will be an integral aspect of the evaluation of the fairness of accounting balances. A practice audit case will be used to develop an appreciation for the application of auditing techniques. 3 credit hours.

A 335 Federal Income Taxation I
Prerequisite: A 112 and junior standing. An introduction to the federal income tax law including objectives, history and sources of tax law and administration. Course coverage will be devoted to different types of tax payers including individuals, corporations, partnerships, limited liability entities, subchapter S corporations, and trusts and estates. The course will explore income tax concepts of accounting methods and periods, income, deduction losses, property transactions, fringe benefits and retirement plans. 3 credit hours.

A 336 Federal Income Taxation II
Prerequisites: A 112 and A 335. Advanced studies in taxation including the tax consequences of the formation, operation and termination of corporations, partnerships and limited liability companies. Course coverage will also be devoted to the alternative minimum tax, related party transactions, estate and gift taxation, financial tax accounting concepts and ethical responsibilities in tax practice. 3 credit hours.

A 337 Federal Income Taxation III
Prerequisites: A 335, A 336. A continuation of A 336 including taxation of S Corporations, partnerships, federal estates and gifts and certain state transfer taxes. Also the income taxation of trusts and estates and tax administration and research. 3 credit hours.

A 350 Accounting Information Systems
Prerequisite: A 221 and junior standing. This course provides a thorough introduction to basic systems theory, a firm working knowledge of systems analysis and design techniques and an examination of various transaction cycles in the accounting system. Emphasis is on EDP environments. 3 credit hours.

A 450-454 Special Topics
Prerequisite: A 112. Junior-level standing required unless specified in course schedule description. Selected topics in accounting or taxation of special or current interest. 3 credit hours.

A 598 Internship
Prerequisite: A 112 and junior standing. On-the-job experience in selected organizations in accounting. 3 credit hours.

A 599 Independent Study
Prerequisite: A 112 and junior standing. A planned program of individual study under the supervision of a faculty member. 3 credit hours.

AVIATION

AE 100 Aviation Science–Private
Basic ground instruction in aircraft systems and controls. FAA regulations, air traffic control, communication, weight and balance, meteorology, navigation, radio facilities and utilization, flight computer and aerodynamic theory. Successful completion of FAA Private Pilot airplane written examination is recommended. 3 credit hours.

AE 110 Aviation Meteorology
Discussion and interpretation of atmospheric phenomena including an analysis of aviation forecasts and reports. 3 credit hours.

AE 120 Foundations of Aviation
A study of the development of avi-

ation from the first efforts to fly through the present. The social and economic impact of aviation on society will be explored. 3 credit hours.

AE 130 Aviation Science–Commercial
Prerequisite: AE 100. Advanced ground instruction in navigation, flight computer, radio navigation, aircraft performance, engine operation, aviation physiology and FAA regulations including FAR Parts 121 and 135. Successful completion of FAA Commercial Pilot airplane written examination is required. 3 credit hours.

AE 140 Concepts of Aerodynamics
The study of basic aerodynamics including theory of flight, analysis of the four forces, high lift devices, subsonic, transonic and supersonic flight. 3 credit hours.

AE 200 Aviation Science–Instrument
Prerequisite: AE 130. Ground instruction in preparation for the FAA Instrument Rating. Study includes a discussion of pertinent regulations, IFR departure, enroute, and arrival procedures, flight planning, instrument approaches, air traffic control procedures and a review of meteorology. Successful completion of FAA Instrument-Airplane written examination is required. 3 credit hours.

AE 210 Gas Turbine Powerplants
Prerequisite: AE 100. Discussion of the fundamentals of design and performance of aircraft jet engines including methods of construction, lubrication, engine operating procedures and control. In addition, the theory of operation and analysis of problems associated with aircraft components and systems involving jet aircraft. 3 credit hours.

AE 230 Flight Instructor Seminar
Prerequisite: AE 200. Discussions of the fundamentals of instruction with specific emphasis on teaching as related to the flight instructor. Detailed study and analysis of maneuvers and topics required of the flight instructor. In addition, emphasis will be placed on practice teaching. Successful completion of FAA written examinations (Flight Instructor Airplane and Fundamentals of Instructing) is required. 3 credit hours.

AE 300 Airline Transport Pilot/Flight Engineer
Prerequisites: AE 110, AE 130, AE 140, AE 200, AE 210. An in-depth knowledge of all aircraft systems as experienced on a large jet transport, advanced computer problems, transport-type airplane weight and balance computation, performance computations, meteorology with emphasis on upper level phenomena, regulations applicable to airline operations. Special emphasis on crew concept in flight operations. Prepares student to take the FAA Airline Transport Pilot and Flight Engineer written exams. 3 credit hours.

AE 310 Air Carrier Operations
Prerequisites: AE 110, AE 130, AE 200. Air carrier operations as related to the flight crew and dispatcher. FAR 121, weight and balance, manifests, planning forms, charts and graphs, performance considerations. Successful completion of the FAA Dispatcher written exam is required. 3 credit hours.

AE 320 Introduction to Air Traffic Control
Prerequisites: AE 110, AE 130, AE 200. An introduction to the air traffic control system at the operational level. The components of the national airspace system with emphasis on interrelationships between enroute, terminal, tower, flight service functions and the pilot. 3 credit hours.

AE 400 Airport Management
Prerequisite: junior status or approval of academic adviser. Discussion and study of operational functions of airports, general aviation operations, terminal building utilization, support facilities, public relations and airport financing as related to the airport manager. 3 credit hours.

AE 410 Corporate Aviation Management
Prerequisite: junior status or approval of academic adviser. Discussion and study of the importance of air transportation to the corporation, operational structure and concepts, cost analysis and budget techniques, aircraft analysis, personnel selection and management, aircraft maintenance,

training and scheduling. 3 credit hours.

AE 420 Airline Management
Prerequisite: LA 101, FI 313 or approval of academic adviser. Discussion of air commerce related to the transportation system. This course includes a study of commercial airlines and fixed-base operations. 3 credit hours.

AE 430 Aviation Safety Seminar
Prerequisite: senior status or approval of academic adviser. Critical analysis of aircraft accidents, accident prevention, development and evaluation of aviation safety programs. 3 credit hours.

AE 440 Aviation Law
Prerequisites: LA 101, A 102, AE 400, AE 410, AE 420. The development of aviation law including federal and state regulatory functions, rights and liabilities of aviators and operators. Case histories, liens and security interest in aircraft, torts, international conferences, bilateral and multilateral agreements, criminal statutes. 3 credit hours.

AE 500 Special Topics
Selected topics of special or current interest in the field of aviation. 3 credit hours.

AE 599 Independent Study
Prerequisite: consent of the program director. Opportunity for the student, under direction of a faculty member, to explore an area of interest. This course must be initiated by the student. 3 credit hours.

ART/VISUAL ARTS

AT 101-102 Introduction to Studio Art I and II
Foundation study in the visual arts designed to heighten the student's aesthetic awareness and to provide an introduction to the study of drawing, painting and design using a variety of materials. 3 credit hours each.

AT 105 Basic Drawing I
A basic foundation course which includes a disciplined study in the fundamentals of drawing such as nature studies, perspective, exercises in coordination of hand and eye. 3 credit hours.

AT 106 Basic Drawing II
A continuation of AT 105 with emphasis on perspective and depiction of three-dimensional space and form by two-dimensional means. Study of architectural forms, natural objects and landscape. 3 credit hours.

AT 122 Graphic Design Production
Prerequisite: AT 100 level course or consent of the instructor. Studio introduction to the technical skills of graphic design including: copyfitting, type specification, typesetting, layout and mechanical preparation. 3 credit hours.

AT 201 Painting I
Problems in pictorial composition involving manipulation of form and color. Various techniques of applying pigment will be explored as well as mixing pigments, stretching and priming canvases. 3 credit hours.

AT 202 Painting II
A continuation of AT 201 with further exploration of two-dimensional pictorial arrangements of form and color for greatest visual effectiveness. Students will be encouraged to develop their own personal idiom in the medium. 3 credit hours.

AT 203 Graphic Design I
Basic theoretical design studies concentrate on the development of a design vocabulary consisting of an understanding of form, proportion, composition, rhythm, juxtaposition, progression and balance. 3 credit hours.

AT 204 Graphic Design II
Prerequisite: AT 203. An investigation of formal aspects of composition, organic and geometric form, graphic translation, and color. Emphasis on concept development, sequencing, and visual logic. 3 credit hours.

AT 205 Ceramics I
Introduction to clay as an expressive medium. Hand-built and wheel-thrown methods with various glazing and decorative techniques. Stacking and firing kilns. An exploration of three-dimensional form. Good for engineers. Laboratory fee; 3 credit hours.

AT 206 Ceramics II
Continuation of AT 205 with free exploration of novel and experimental approaches to the medium. Laboratory fee; 3 credit hours.

AT 209-210 Photography I and II
Introduction to the technical and aesthetic aspects of black and white photography. Camera controls, exposure, development and printmaking will be covered along with a simultaneous investigation into photographic design, historical tradition and media use. Photography II gives special emphasis on each student creating a body of work which possesses a cohesiveness of vision. Further investigation of photographic technique. Laboratory fee; 3 credit hours each.

AT 211 Basic Design I
A basic foundation course includes exploration of two-dimensional visual elements–line, color, light and dark, shape, size, placement, and figure-ground, and their effective use. A basic course for those wishing basic art understanding. 3 credit hours.

AT 212 Basic Design II
A continuation of AT 211, with concentration on three-dimensional elements of design including positive and negative volumes, surfaces, structural systems, and other elements, employing a variety of materials. 3 credit hours.

AT 213 Color
An intensive exploration of color perception and interaction with manipulation of form and color for greatest effectiveness in pictorial compositions. 3 credit hours.

AT 216 Architectural Drawing
Prerequisite: AT 105. Drawing as applied to architectural problems. Drafting, drawing conventions, presentations, graphic symbols, line quality and context, and freehand drawing. 3 credit hours.

AT 221 Typography I
Prerequisite: AT 203, AT 211. An introduction to the form, language, terminology and use of typography. Letters, words and text arrangements form the components in these theoretical studies, which lead to simple communication exercises. 3 credit hours.

AT 222 Typography II
Prerequisite: AT 221. Exploration of typographic structures and hierarchies as well as formal aspects of text. The typographic principles are applied to complex communication problems such as publication design and information graphics. 3 credit hours.

AT 225 Photographic Methods
Prerequisite: AT 209. An exploration of ideas, experiments and investigations in alternative photographic processes. Includes toning, cyanotype printing, gum bichromate, platinum and palladium. Also covered will be negative manipulation, hand applied color and pinhole cameras. Laboratory fee; 3 credit hours.

AT 231 History of Art I
Western art from cave art through the Middle Ages to Gothic. This course seeks to understand expressive, social, cultural, political and economic aspects of the cultures in which specific art styles and visual developments emerged. This course forms the basic vocabulary for History of Art II. Includes economic and technological changes in the societies and their reflections in art. Appropriate for business and engineering students. 3 credit hours.

AT 232 History of Art II
Western art from the Renaissance to the twentieth century in Europe and America; a continuation of AT 231. 3 credit hours.

AT 233 History of Architecture and Interior Design
A survey of developments in architecture from antiquity to the present day. Special consideration of the aesthetic and practical relationships of architectural space to interior decor. For the major and those interested in this field. 3 credit hours.

AT 302 Figure Drawing
Prerequisite: AT 105 or consent of the instructor. Study of drawing which concentrates on the human figure. 3 credit hours.

AT 304 Sculpture I
The exploration of three-dimensional materials for maximum effectiveness in expressive design. Experimentation with clay, plaster,

wood, stone, canvas, wire screening, metal, found objects. A basic understanding of major, fundamental methods: casting and carving. Laboratory fee; 3 credit hours.

AT 305 Sculpture II
A continuation of AT 304 with further exploration of three-dimensional materials and the possibilities they present for creative visual statements. Laboratory fee; 3 credit hours.

AT 309 Photographic Design
Prerequisite: AT 209. Introduction to basic materials and techniques of black and white photography used in graphic design. The relation between image and type, as well as sequencing and the extended print will be explored along with collage and basic bookmaking. Laboratory fee; 3 credit hours.

AT 310 Photographic Lighting
Prerequisite: AT 209. Aesthetic and technical understanding of light. Use of natural and artificial lighting systems and methods for working with both color and black and white film. Emphasis on the portrait and still life image as well as creative problem solving. Laboratory fee; 3 credit hours.

AT 311 Color Photography
Prerequisite: AT 209. Theory and practice of color photography Study of current color photographic materials and processes. Laboratory fee; 3 credit hours.

AT 315 Printmaking
The expressive potential of the graphic image through the techniques of monoprints, etching, silkscreening and photo/computer scanned printing processes. Laboratory fee; 3 credit hours.

AT 317 Interior Design
Prerequisites: AT 211 or AT 212; AT 233 or instructor's consent. A basic studio course with exploration of interior design problems and their relationship to architecture. Special emphasis on exploitation of space, form, color and textures for greatest effectiveness. 3 credit hours.

AT 322 Illustration
A solid foundation in the techniques of creative illustration. Various media and their expressive possibilities will be studied: charcoal, pencil, pen and ink, wash, colored pencils, acrylic. Focuses on application of these techniques. 3 credit hours.

AT 331 Contemporary Art
Focusing on art since 1945. The developments of the present stem from ideas emanating from the 1870s–especially Impressionism; this course seeks to understand these connections. Emphasis on economic, historical and technological developments. Appropriate for business, communication, history and engineering students. 3 credit hours.

AT 333 Survey of Afro-American Art
Black art in the United States from the Colonial period to the present. Consideration of African cultural influences. Analysis of modern trends in Black art. 3 credit hours.

AT 401 Studio Seminar I
Prerequisites: AT 101-102, AT 201, AT 302 or AT 209, and art electives. Drawing on development through their previous study, students will concentrate on major projects in the areas of their choice. 1-4 credit hours.

AT 402 Studio Seminar II
Prerequisite: AT 401. Continuation of Studio Seminar I. 1-4 credit hours.

AT 403-412 Selected Topics
Selected topics of special or current interest in applied art or history of art. Variable credit hours.

AT 599 Independent Study
Prerequisites: consent of the instructor and department chair. Opportunity for the student, under the direction of a faculty member, to explore an area of interest. This course must be initiated by the student. 1-3 credit hours.

BUSINESS ADMINISTRATION

BA 100 Leadership in the Business Community
Leaders and their behavior as it pertains to the role of the leader within the organizarion is the focus

for this participatory course. Theory and current research regarding leadership are discussed as well as the prerequisites, knowledge and practices required for successful leadership. Student participation will be enhanced through use of videotape, role playing, writing activities and presentations. 3 credit hours.

BIOLOGY

Biology courses marked with an asterisk (*) are usually scheduled every other academic year. Courses marked with the symbol (†) may be offered at the discretion of the department.

BI 115 Nutrition and Dietetics
The various nutrients, their food sources and the interaction between these nutrients and the body. Nutrition as related to disease. Energy production, weight-loss, weight-gain and normal diets. 3 credit hours.

BI 121-122 General and Human Biology with Laboratory I and II
An introduction to the study of biology which integrates biological principles and human biology. Major topics covered are biochemistry, cell and molecular biology, genetics, anatomy and physiology, behavior, ecology and evolution. The laboratory involves experimentation and demonstration of principles covered in lecture. BI 121 is a prerequisite for BI 122. Laboratory fee; 4 credit hours each term.

BI 253-254 Biology for Science Majors with Laboratory I and II
A discussion of the principles of biological organization from the molecular level through the ecological. The basic course for biology and environmental studies majors. Laboratory fee; 4 credit hours each term.

BI 261 Introduction to Biochemistry
Prerequisite: CH 105 or equivalent. An introduction to biochemistry including the study of pH, water bioenergetics, enzymes, and the structure, function and metabolism of carbohydrates, proteins, lipids, and nucleic acids. A non-laboratory course for students in dental hygiene and dietetics. Not open to biology majors. 3 credit hours.

BI 301 Microbiology with Laboratory
Prerequisites: BI 121 or BI 253 and one college course in general chemistry. A history of microbiology and a survey of microbial life. Includes viruses, rickettsia, bacteria, blue-green algae and fungi; their environment, growth, reproduction, metabolism and relationship to man. Laboratory fee; 4 credit hours.

***BI 303 Cells and Tissues with Laboratory**
Prerequisite: BI 121 or BI 253. Microscopic and chemical structures of normal tissues, organs and their cellular constituents as related to function. Laboratory includes microscopic observation, tissue staining and slide preparation. Laboratory fee; 4 credit hours.

BI 304 Immunology with Laboratory
Prerequisites: BI 121 or BI 253 and one college course in general chemistry. The nature of antigens and antibodies, formation and action of the larrer, other immunologically active components of blood and tissues and various immune reactions. Laborarory emphasizes currenr antibody methodology. Laboratory fee; 4 credit hours.

***BI 305 Developmental Biology with Laboratory**
Prerequisire: BI 122 or BI 254. A survey of developmental biology integrating classical embryology with modern concepts of cellular development. Laborarory will include examination of embryonic serial sections as well as modern cellular and molecular studies of development. Laboratory fee; 4 credit hours.

BI 308 Cell Biology with Laboratory
Prerequisites: BI 121 or BI 253, one college course in general chemistry and one college course in general physics. Basic theories of physiology as applied to cells. Emphasis on cellular structure and function as well as cell-cell interactions in multicellular organisms. Laboratory will stress practical aspects and modern techniques. Laboratory fee; 4 credit hours.

BI 309-310 Vertebrate Anatomy and Physiology with Laboratory I and II
Prerequisites: BI 121-122 or BI 253-254. Examination of structure

and function of vertebrate organ systems with an emphasis on human systems. Laboratory fee; 4 credit hours each term.

BI 311 Genetics and Molecular Biology with Laboratory
Prerequisite: BI 121 or BI 253. An in-depth discussion of nucleic acids, the flow of information from nucleic acids to protein and the control of gene activity. Laboratory emphasizes the techniques of modern molecular biology. Laboratory fee; 4 credit hours.

***BI 315 Nutrition and Disease**
Prerequisites: BI 115 and either BI 122 or BI 254. Aspects of diet in treating and preventing various symptoms and syndromes, diseases, inherited errors of metabolism and physiological stress conditions. 3 credit hours.

***BI 320 Ecology with Laboratory**
Prerequisites: CH 116 and BI 254 (or BI 122 with permission of instructor). An investigation of the major subdisciplines of ecology including organismal, population, community ecosystem and landscape ecology. Human impacts and environmental management and assessment are also considered. Laboratory includes designing ecological studies, field sampling techniques ecological analysis, using global positioning systems in ecological studies and gathering information on the Internet. Several weekend field classes are required. Laboratory fee; 4 credit hours.

BI 350 Invertebrate Zoology with Laboratory
Prerequisite: BI 122 or BI 254. A survey of invertebrate phyla focusing on taxonomy, evolutionary relationships, structure and function, physiological adaptations and life modes. Laboratory includes: examination of the structure and anatomy of representative taxa from the phyla, experiments and observations on behavior and responses to varying environmental conditions. Labora-tory fee; 4 credit hours.

†BI 433 Medical Microbiology with Laboratory
Prerequisites: BI 301, CH 115. A study of the more common diseases caused by bacteria, fungi and viruses, including their etiology, transmission, laboratory diagnosis and control. Laboratory fee; 4 credit hours.

BI 461 Biochemistry with Laboratory
Prerequisites: CH 201, CH 202, CH 203 and CH 204. A survey of biochemistry including a discussion of pH, buffers, water, bioenergetics, oxidative phosphorylation, enzymology, metabolic regulation, and the structure, function and metabolism of carbohydrates, proteins, lipids, nucleic acids, vitamins and cofactors. Laboratory exercises are primarily designed to concentrate on various experimental techniques including electrophoresis, chromatography, spectrophotometry, centrifugation and enzymology. Laboratory fee; 4 credit hours.

BI 498 Internship
Prerequisite: junior or senior standing; biology or environmental science major. Supervised field experience for qualified students in areas related to biology and/or environmental science. Minimum of 150 hours of field experience required. 3 credit hours.

BI 501 Protein Biochemistry and Enzymology
Prerequisites: BI 461, CH 201-204. First course in a series of advanced biochemistry courses; examines the relationship between protein structure and function. Topics include properties of proteins and amino acids, protein folding, enzyme kinetics and enzyme regulation. 3 credit hours.

BI 502 Biochemistry of Bioenergetics
Prerequisites: BI 461, CH 201-204. Second course in the advanced biochemistry course series; examines cellular metabolism, the transfer of chemical energy and the biosynthesis of amino acids, carbohydrates, fatty acids and nucleotides. 3 credit hours.

BI 503 Biochemistry of Information Pathways
Prerequisites: BI 461, CH 201-204. Final course in the series of advanced biochemistry courses; examines the biochemistry of nucleic acids, their function as genetic information and control over the expression of that information, nucleic acid-protein interactions, oncogenes and carcinogenes. 3 credit hours.

***BI 510 Environmental Health**
Prerequisites: BI 310 and a college chemistry course. The emphasis is on the health effects of environmental and occupational pollutants and on the spread and control of communicable diseases. Toxicological and epidemiological techniques are discussed. 3 credit hours.

BI 511 Molecular Biology of Proteins with Laboratory
Prerequisites: BI 311 and BI 461. Because the techniques for working with proteins are basic to the cell and molecular biologist and extend beyond the understanding of basic protein biochemistry, this course provides a theoretical understanding of methods commonly utilized for protein/peptide analysis. In the laboratory students will isolate proteins from various tissues or expression systems and analyze them by one–and two–dimensional polyacrylamide gel electrophoresis. Laboratory fee; 4 credit hours.

BI 513 Molecular Biology of Nucleic Acids with Laboratory
Prerequisites: BI 311 and BI 461. Examination of gene expression and the techniques available for manipulating DNA, RNA and protein expression. Course utilizes an extensive laboratory component to instruct students in the practical and technical aspects of working with nucleic acids. Laboratory fee; 4 credit hours.

BI 520 Computer Applications in Cellular and Molecular Biology
Prerequisite: BI 311. Students will become familiar with uses of computers in cellular and molecular biology, and will be introduced to databases that are presently available for nucleic acid and protein sequences as well as literature citations. Students will work with modeling software which looks for potential secondary structures within both protein and DNA sequences. 3 credit hours.

BI 590 Special Topics in Biology/Science
A course(s) covering topics in biology or science which are of special or current interest. 1-4 credit hours.

BI 591-592 Seminar I and II
Prerequisite: biology major in junior or senior year. Meetings are held one hour weekly during which a research paper is reviewed by a member of the class. Each student, with the help of the adviser, must select an article in a biological periodical from which is developed a 20-minute discourse on its content. 1 credit hour each term.

BI 595-596 Laboratory Research I and II
Prerequisite: biology major, consent of the department. Choice of a research topic, literature search, planning of experiments, experimentation and correlation of results in a written report, under the guidance of a department faculty member. Three hours of work per week required per credit hour. Laboratory fee; 1-6 credit hours.

BI 599 Independent Study
Prerequisites: biology major, consent of the department. Weekly conferences with adviser. Three hours of work per week required per credit hour. Opportunity for the student, under the direction of a faculty member, to explore an area of personal interest. A written report of the work carried out is required. 1-3 credit hours, maximum of 6.

CIVIL ENGINEERING

CE 201 Statics
Prerequisites: PH 150, M 117. Composition and resolution of forces in two and three dimensions. Equilibrium of forces in stationary systems. Analysis of trusses, frames and machines. Centroids and second moments of areas, distributed forces and friction. 3 credit hours.

CE 202 Strength of Materials I
Prerequisite: CE 201. Elastic behavior of structural elements under axial, flexural and torsional loading. Shear and bending moment diagrams. Stress in and deformation of members, including beams, columns and connections. 3 credit hours.

CE 203 Elementary Surveying
Prerequisite: M 115 or permission of instructor. Theory and practice of surveying measurements using tape, level and transit. Field practice in traverse surveys and leveling.

Traverse adjustment and area computations. Adjustment of instruments, error analysis. Laboratory fee; 3 credit hours.

CE 205 Statics and Strength of Materials
Prerequisites: PH 150, M 118 (may be taken concurrently). Effects and distribution of forces on rigid bodies at rest. Various types of forces systems, friction, centet of gravity, centroids and moments of inertia. Relation between externally applied loads and their internal effects on nonrigid, deformable bodies. Stress, strain, Hooke's law, Poisson's ratio, bending and torsion, shear and moment diagrams, deflection, combined stress and Mohr's circle. 4 credit hours.

CE 206 Engineering Geology
Introduction to relationship between geologic processes and principles to engineering problems. Topics include engineering properties of rock as a construction and foundation material, soil formation and soil profiles and subsurface water. 3 credit hours.

CE 218 Civil Engineering Systems
Prerequisites: CE 205, CS 110, M 118. An introduction to civil engineering design. Analyze needs, determine capacities and develop design alternatives for civil engineering systems. Structures, water and wastewater facilities, geotechnical and transportation systems are studied. 3 credit hours.

CE 301 Transportation Engineering
Prerequisite: M 117. A study of planning, design and construction of transportation systems including highways, airports, railroads, rapid transit systems and waterways. 3 credit hours.

CE 302 Building Construction
Introduction to the legal, architectural, structural, mechanical and electrical aspects of building construction. Principles of drawing and specification preparation and cost estimating. 3 credit hours.

CE 304 Soil Mechanics
Prerequisite: M 203. Soil classifications. Methods of subsurface exploration. Design principles are related to the potential behavior of soils subjected to various loading conditions. Seepage analyses. 3 credit hours.

CE 306 Hydraulics
Prerequisite: M 204 or permission of instructor. The mechanics of fluids and fluid flow. Fluid statics, laminar and turbulent flow. Energy, continuity and momentum. Analysis and design of pipes and open channels. Orifices and weirs. 3 credit hours.

CE 309 Water Resources Engineering
Prerequisite: CE 306. Study of principles of water resources engineering including surface and ground water hydrology. Design of water supply, flood control and hydroelectric reservoirs. Hydraulics and design of water supply distribution and drainage collection systems including pump and turbine design. Principles of probability concepts in the design of hydraulic structures. General review of water and pollution control laws. 3 credit hours.

CE 312 Structural Analysis
Prerequisite: CE 205. Basic structural engineering topics on the analysis of beams, trusses and frames. Topics include: load criteria and influence lines; force and deflection analysis of beams and trusses; analysis of indeterminate structures by approximate methods, superposition and moment distribution. Computer applications and a semester-long design-analysis project requiring engineering decisions. 3 credit hours (two hours lecture, two hours discussion).

CE 315 Environmental Engineering
Prerequisites: CH 115, CH 117, CE 309. Introduction to water supply and demand. Water quantity and quality. Design and operation principles of water and wastewater treatment, disposal and reuse systems. Collection, recycling and disposal practices of solid wastes. Fundamentals of air pollution and air pollution control. 3 credit hours.

CE 323 Mechanics and Structures Laboratory
Prerequisite: CE 312 (may be taken concurrently). Experiments covering mechanics and structural engineering. The response of metals and

wood to different loading conditions will be examined. Laboratory instrumentation will be studied. Laboratory procedures, data collection, interpretation and presentation will be emphasized. 2 credit hours.

CE 327 Soil Mechanics Laboratory
Prerequisite: CE 304 (may be taken concurrently). Experiments and laboratory testing in geotechnical engineering. Lab testing includes: classification, density, hydraulic conductivity, shear strength and consolidation tests. Laboratory procedures and data collection, interpretation and presentation will be discussed. 2 credit hours.

CE 328 Hydraulics and Environmental Laboratory
Prerequisites: CE 315 (may be taken concurrently). Fundamentals of data collection, analysis and presentation. Principles of technical report writing. Laboratory methods in hydraulics and environmental engineering. Experiments include pipe and open channel flow, analysis of various hydraulics structures, pumps and other hydraulic machinery, titrimetric, gravimetric and instrumental methods in water/ wastewater quality testing. 2 credit hours.

CE 401 Foundation Design and Construction
Prerequisite: CE 304 or consent of instructor. Application of soil mechanics to foundation design, stability, settlement. Selection of foundation type–shallow footings, deep foundations, pile foundations, mat foundations. Subsurface exploration. 3 credit hours.

CE 403 City Planning
Prerequisite: senior status or permission of instructor. Engineering, social, economic, political and legal aspects of city planning. Emphasis placed on case studies of communities in Connecticut zoning. Principles and policies of redevelopment. 3 credit hours.

CE 404 Water and Wastewater Engineering
Prerequisite: CE 315. Physical, chemical and biological aspects of water quality and pollution control. Study of unit operations and processes of water, wastewater and wastewater residuals treatment. Emphasis on hydraulic and process design of water pollution control facilities. 3 credit hours.

CE 405 Indeterminate Structures
Prerequisites: ME 307 or CE 312, CS 110, ME 204. The analysis of statically indeterminate structures. Topics include approximate methods, moment distribution, conjugate beam, energy methods, influence lines and an introduction to matrix methods. Computer applications and a project requiring structural engineering decisions. 3 credit hours.

CE 407 Professional and Ethical Practice of Engineering
Prerequisite: senior status or permission of instructor. Principles of engineer-client, engineer society and owner-contractor relationships examined from ethical, legal and professional viewpoints. Examination of codes of ethics and preparation of contract documents. 3 credit hours.

CE 408 Steel Design and Construction
Prerequisite: CE 312. Analysis, design and construction of steel structures. Topics include tension, compression and flexural members; connections; members subjected to torsion; beam-columns; fabrication, erection and shop practice. Designs will be based on Load Resistance Factor Design (LRFD). 3 credit hours (two hours lecture, two hours discussion) .

CE 409 Concrete Design and Construction
Prerequisite: CE 312. Analysis and design of reinforced concrete beams, columns, slabs, footings, retaining walls. Fundamentals of engineering shop drawings. 3 credit hours (two hours lecture, two hours discussion).

CE 410 Land Surveying
Prerequisite: consent of instructor. A study of boundary control and legal aspects of land surveying including deed research, evidence of boundary location, deed description and riparian rights. Theory of measurement and errors, position precision, state plane coordinate systems, photo-gammetry. 3 credit hours.

CE 411 Highway Engineering
Prerequisite: CE 301 or consent of instructor. Highway economics and financing. Study of highway planning, geometric design and capacity. Pavement and drainage design. 3 credit hours.

CE 412 Wood Engineering
Prerequisite: CE 205. Study of the growth and structure of wood and their influence on strength and durability, preservation and fire protection. The analysis and design of structural members of wood using the Allowable Stress Design method (ASD) including beams, columns and connections. The design of wood structures. Discussion of Load Resistance Factor Design (LRFD). 3 credit hours (two hours lecture, two hours discussion).

CE 413 Masonry Engineering
Prerequisite: CE 205. The design and analysis of brick and concrete masonry non-reinforced and reinforced structures. Strength, thermal, fire and sound characteristics, testing and specifications. 3 credit hours.

CE 414 Route Surveying
Prerequisite: CE 203. A continuation of elementary surveying covering principles of route surveying, stadia surveys, practical astronomy, aerial photography, adjustments of instruments. Field problems related to classroom designs. 3 credit hours.

CE 415 Traffic Engineering
Prerequisite: CE 301 or junior status. Traffic flow theory including data collection, data analysis, freeways, multilane highways, signalized and unsignalized intersections, intersection signal coordination. Students will be taughr how to use several computer programs to analyze traffic flow along roadways. Projects will deal with actual locations in the area. 3 credit hours.

CE 450-454 Special Topics
Selected topics of special or current interest in the field of civil engineering. 1-3 credit hours.

CE 500 Senior Project I
Prerequisite: senior status. An introduction to project planning and presentation. This course will prepare the student for professional practice by teaching organizational skills, scheduling, technical writing for a lay audience and oral presentation. Students will begin working on their senior design project and use this preliminary work in their course assignments. Oral and written presentations will be given to update the class on the progress of the project. 3 credit hours.

CE 501 Senior Project II
Prerequisite: CE 500. Supervised individual or group project. The project may be the preparation of a set of contract documents for the construction of a civil engineering facility, research work with a report or a project approved by the faculty adviser. 3 credit hours.

CE 505 Solid Waste Management
Prerequisite: CE 315. Characteristics, volumes, collection and disposal of solid waste and refuse. Design of processing, recycling and recovery equipment, landfill design and operation; resource recovery; incineration. 3 credit hours.

CE 520 Engineering Hydrology
Prerequisite: CE 309. Theory, methods and applications of hydrology to contemporary engineering problems. Methods of data collection and analysis as well as design procedures are presented for typical engineering problems. Specific topics to be considered within this framework include the rainfall/runoff process, hydro graph analysis, hydrologic routing, urban runoff, storm water models and flood frequency analysis. 3 credit hours.

CE 523 Open Channel Hydraulics
Prerequisite: CE 309. Basic theories of open channel flow will be presented and corresponding equations developed. Methods of calculating uniform/steady flow; gradually varied flow; and rapid, spatially varied, unsteady flow will be investigated. Flow through bridge piers, transitions and culverts; backwater curves and the design of open channels. 3 credit hours.

CE 599 Independent Study
Prerequisite: consent of instructor and department chair. Opportunity for the student to explore an area of interest under the direction of a faculty member. Course must be initiated by the student and have the approval of the faculty adviser and chair. 1-3 credit hours.

COMPUTER ENGINEERING

CEN 457 Design Preparation
Prerequisite: senior standing. This course provides the student time and guidance in selecting a topic for the senior design course (CEN 458) which follows this one. Suitable design projects may be suggested by the student, the faculty or contacts in industry. The project should include both hardware and software. Each student carries out a literature search on the topic, prepares a written proposal with a plan of action for the project, obtains approval from the faculty adviser, makes oral reports of work in progress and presents a formal project proposal. 3 credit hours.

CEN 458 Senior Design Laboratory
Prerequisite: CEN 457. Students complete the design planned in CEN 457. This course provides students with experience at a professional level with engineering projects that involve analysis, design, construction of prototypes and evaluation of results. The project should include both hardware and software. A final report presentation and a formal written report are required. 3 credit hours.

CHEMISTRY

CH 103 Introduction to General Chemistry
Introductory course for students without a high school chemistry background. Fundamentals of chemistry including such topics as elements, compounds, nomenclature and practical applications. Intended primarily for nonscience and nonengineering majors. CH 104 is taken concurrently with CH 103. 3 credit hours.

CH 104 Introduction to General Chemistry Laboratory
To be taken with CH 103. Experiments include systems of measurement, the measurement of physical properties, determination of percentage of composition, chemical formulas, and chemical reactions. 1 credit hour.

CH 105 Introduction to General and Organic Chemistry with Laboratory
Fundamentals of general and organic chemistry: atomic structure and properties of compounds, stoichiometry and reactions, energy relationships, states of matter, solutions, hydrocarbons and classes of organic compounds. 4 credit hours.

CH 115 General Chemistry I
Prerequisite: High school algebra or M 109, CH 103, CH 105 or one unit of high school chemistry or written qualifying exam. Brief review of fundamentals including stoichiometry, atomic structure and chemical bonding. Other topics include thermochemistry, gas laws, properties of solution and inorganic coordination compounds. Intended primarily for science/engineering majors. CH 117 is taken concurrently with CH 115. 3 credit hours.

CH 116 General Chemistry II
Prerequisites: CH 115, CH 117 or the equivalent. Topics include nuclear chemistry; rates of chemical reactions; chemical equilibria including pH, acid-base, common ion effect, buffers and solubility products; thermodynamics; an introduction to organic and biochemistry. Problems in each area include environmental applications. CH 118 is taken concurrently with CH 116. 3 credit hours.

CH 117 General Chemistry I Laboratory
To be taken with CH 115. Experiments include percent composition, stoichiometry, heats of reaction, gas laws, molecular model building and colligative properties of solutions. 1 credit hour.

CH 118 General Chemistry II Laboratory
To be taken with CH 116. Experiments include quantitative measurements of chemical reaction rates, equilibrium constants, the common ion effect, pH, buffers, electrochemical cells and simple organic synthesis. 1 credit hour.

CH 201-202 Organic Chemistry I and II
Prerequisites: CH 116, CH 118. Common reactions of aliphatic and aromatic chemistry with emphasis

on functional groups and reaction mechanisms. CH 203 and CH 204 are taken concurrently with CH 201-202. 3 credit hours each term.

CH 203-204 Organic Chemistry I and II Laboratory
To be taken with CH 201-202. Some of the techniques, reactions, and syntheses commonly employed in the organic chemistry laboratory are covered on microscale level interspersed with scaleups including qualitative organic analysis and FTIR analysis. 1 credit hour each term.

CH 211 Quantitative Analysis with Laboratory
Prerequisites: CH 116, CH 118. Theory and applications of acid-base, solubility, complex-formation and oxidation-reduction equilibria to quantitative chemical analysis; introduction to statistics and evaluation of results. Laboratory analysis of samples by gravimetric and volumetric methods. 4 credit hours.

CH 221 Instrumental Methods of Analysis with Laboratory
Prerequisites: CH 201, CH 203, CH 211 or permission of instructor. Theory and applications of various instrumental methods with emphasis on ultraviolet, visible, atomic absorption, fluorescence, infrared and nuclear magnetic resonance spectroscopy; mass spectrometry; gas and liquid chromatography; and potentiometry. Laboratory analysis of samples by methods discussed in the lecture. 4 credit hours.

CH 321-322 Plastics and Polymer Chemistry I and II
Prerequisites: CH 116, CH 118, CH 202, CH 204. All phases of the plastics and polymers field, including the chemistry involved, methods of production, physical properties and the uses of specific polymers. 3 credit hours each term.

CH 331-332 Physical Chemistry I and II
Prerequisites: CH 116, PH 205, M 203 (may be taken concurrently). Kinetic theory of gases, thermodynamics, phase equilibria, transport and surface phenomena, kinetics, quantum mechanics, atomic and molecular spectroscopy. 3 credit hours each term.

CH 333-334 Physical Chemistry I and II Laboratory
To be taken with CH 331-332. Laboratory training in vacuum line techniques and real time collection of temperature, pressure and spectrophotometric data by microcomputer. Experiments include: diffusion, velocity and heat capacities of gases; calorimetry; phase diagrams of mixtures; electro-chemical properties, kinetics of fast reactions, enzyme and oscillating reactions; rotational-vibrational spectroscopy. 1 credit hour each term.

CH 341 Synthetic Methods in Chemistry
Prerequisites: CH 202, CH 204, CH 221. A one-semester laboratory course covering the synthesis and characterization of inorganic and organic compounds. Geometric and optical isomerism, oxidation reactions, electrophilic and nucleophilic aromatic substitution, organo-metallics, electrochemical methods, transition metal compounds, boron compounds, classical organic syntheses and chemical kinetics. Characterization of compounds by UV, IR, NMR, mass spectrometry and other instrumental methods. Eight hours of laboratory per week. 4 credit hours.

CH 411 Chemical Literature
Prerequisites: CH 202, CH 204, CH 332. Acquaints the student with the chemical literature and its use. Assignments include library searches and online STN searching. 1 credit hour.

CH 412 Seminar
Prerequisite: CH 411. The student researches a specific current topic in chemical research or applied chemistry and presents a formal seminar to the faculty and students. 1 credit hour.

CH 451 Thesis with Laboratory
Prerequisites: CH 202, CH 204, CH 211, CH 221, CH 332. An original investigation in the laboratory and/or library under the guidance of a member of the department. A final thesis report is submitted. 2 credit hours.

CH 452-455 Special Topics in Chemistry
Prerequisite: consent of instructor. In-depth study of topics chosen from areas of particular and current interest to chemistry and chemical engineering students. 1-4 credit hours.

CH 471 Industrial Chemistry
Prerequisites: CH 202, CH 211, CH 221, CH 332. A course to bridge the gap from the academic to the industrial world. Topics include material accounting, energy accounting, chemical transport, reactor design, process development and control. 3 credit hours.

CH 501 Advanced Organic Chemistry
Prerequisites: CH 202, CH 204. Topics include chemical bonding and molecular structure, and primary mechanisms of various reactions such as substitutions, eliminations, rearrangements, and symmetry. 3 credit hours.

CH 521 Advanced Inorganic Chemistry
Prerequisite: CH 331. Corequisite: CH 332. Review of atomic structure and introduction to group theory and symmetry. The chemistry of transition metal complexes and organometallic compounds with emphasis on bonding and structure, physical and chemical properties and reaction mechanisms including catalysis and photochemistry. Bioinorganic chemistry and ionic solids will be covered as time permits. 3 credit hours.

CH 599 Independent Study
Prerequisite: consent of instructor. Opportunity for the student under the direction of a faculty member to explore an area of interest. This course may be used to do preliminary work on the topic studied for Thesis (CH 451). 1-4 credit hours.

CRIMINAL JUSTICE

CJ 100 Introduction to Criminal Justice
Survey of criminal justice system with emphasis on prosecution, corrections and societal reaction to offenders. Retribution, rehabilitation, deterrence and incapacitation serve as generic frames of reference and theoretical points of departure for analyzing the dispositional and correctional processes. The course focuses on the process–from the police and prosecution through the courts; from the courts through the correctional system. 3 credit hours.

CJ 102 Criminal Law
The scope, purpose and definitions of substantive criminal law: criminal liability, major elements of statutory and common law offenses (with some reference to the Connecticut Penal Code) and significant defenses. 3 credit hours.

CJ 105 Introduction to Security
General survey of the major historical, legal and practical developments and problems of security. Course stresses the components, organization and objectives of security, the trend toward profession-alization, the role of security in the public and private sectors and its relationship to management. 3 credit hours.

CJ 201 Principles of Criminal Investigation
Introduction to criminal investigation in the field. Conducting the crime scene search, interview of witnesses, interrogation of suspects, methods of surveillance and the special techniques employed in particular kinds of investigation. 3 credit hours.

CJ 203 Security Administration
An overview of security systems found in retail, industrial and governmental agencies, the legal framework for security operations, and the administrative and procedural processes in security management. 3 credit hours.

CJ 204 Forensic Photography with Laboratory
Introduction to basic techniques, material and other aspects of crime scene photographs. Theory and practice of photographic image formation and recordings. Laboratory exercises with emphasis on homicide, sex offenses, arson and accident photograph techniques. Laboratory fee; 3 credit hours.

CJ 205 Interpersonal Relations
Prerequisite: P 111. Theories, conceptual models and research related to interpersonal relations. Topics include reciprocal theory, attitudes and labeling theory. 3 credit hours.

CJ 209 Correctional Treatment Programs
Prerequisites: CJ 100. Various treatment modalities employed in the rehabilitation of offenders. Field visits to various correctional treatment facilities such as half-way houses and community-based treatment programs. 3 credit hours.

CJ 210 Ethnic and Gender Issues in Criminal Justice
Introduction to issues of diversity within the criminal justice system. The course will focus on prejudice and discrimination along with other special problems experienced by women, gays and various ethnic and racial minority groups in dealing with the criminal justice system. 3 credit hours.

CJ 215 Introduction to Forensic Science
Prerequisite: CJ 201. A classroom lecture/discussion session and a laboratory period. Topics include the recognition, identification, individualization and evaluation of physical evidence such as hairs, fibers, chemicals, narcotics, blood, semen, glass, soil, fingerprints, documents, firearms and tool marks. Laboratory fee; 3 credit hours.

CJ 217 Criminal Procedure I
Prerequisites: CJ 100, CJ 102. An inquiry into the nature and scope of the U.S. Constitution as it relates to criminal procedures. Areas discussed include the law of search and seizure, arrests, confessions and identification. 3 credit hours.

CJ 218 Criminal Procedure II and Evidence
Prerequisites: CJ 100, CJ 102. Legal doctrines employed in controlling the successive stages of the criminal process. Rules of law related to wiretapping and lineups, pretrial decision making, juvenile justice and trial. 3 credit hours.

CJ 220 Legal Issues in Corrections
Prerequisites: junior status and CJ 100, CJ 217. Examination of the legal foundations of correctional practice and review of recent judicial decisions which are altering the correctional environment. An analysis of the factors and forces which are creating a climate of significant reform in corrections. 3 credit hours.

CJ 221 Juvenile Justice System
Prerequisites: CJ 100, P 111. Analysis of stages and decisions made at critical junctures of the juvenile justice process. Topics include an analysis of Supreme Court treatment of juvenile justice issues and the ability of the juvenile justice system to respond to juvenile crime. Focus on the processing of juveniles through the system, and the special problems unique to juvenile justice. 3 credit hours.

CJ 226 Industrial Security
Prerequisite: CJ 105. Concepts of security as it integrates with industrial management systems presented along with industrial security requirements and standards, alarms and surveillance devices, animate security approaches, costing, planning and engineering. Principles of safety practices and regulations, fire prevention, property conservation, occupational hazards and personal safeguards. 3 credit hours.

CJ 227 Fingerprints with Laboratory
Prerequisites: CJ 201, CJ 215. The genetics and mathematical theory relating to fingerprints, chemical and physical methods used in developing latent fingerprints, and major systems of fingerprint classification. Laboratory fee; 3 credit hours.

CJ 250 Scientific Methods in Criminal Justice
Prerequisites: CJ 100 and M 109 or M 127. Introduction to the use of scientific methods and logic in the criminal justice profession. Topics studied will include science and the scientific approach to problem solving, the logic of causal inference, problem and hypothesis formulation, the use of experimental designs, laboratory methods, survey research methods and measurement issues in criminal justice. 3 credit hours.

CJ 251 Quantitative Applications in Criminal Justice
Prerequisites: CJ100, CJ 250; M 109 or M 127. Introduction to the use of quantitative analysis in criminal justice through study of the basic statistical tools and databases used in criminal justice. Emphasis will be on applied applications of quantitative methods in policing, courts and corrections. 3 credit hours.

CJ 300 History of Criminal Justice
Prerequisite: CJ 100. The development of the major CJ elements including police, prisons, probation and parole. Significant historical events and philosophical postulates as they pertain to this development. 3 credit hours.

CJ 301 Group Dynamics in Criminal Justice
Prerequisites: CJ 205, P 111. Analysis of theory and applied methods in the area of group process. Focus on both individual roles and group development as they relate to criminal justice issues. Experiential exercises are included. 3 credit hours.

CJ 303-304 Forensic Science Laboratory I and II
Prerequisite: CJ 215. Specific examination of topics and laboratory testing procedures introduced in CJ 215. In the classroom, laboratory procedures are outlined and discussed. Identification and individualization of evidence; casting of hairs and fibers for microscopic identification; electrophoretic separation of blood enzymes. Laboratory fee; 3 credit hours each term.

CJ 306 Security Problems Seminar
Prerequisites: CJ 105, CJ 203. An analysis of special problem areas including college and university campuses, hospitals, hotel/motels, etc. Also, special problems concerning computer protection, bank security, executive personnel protection, credit cards, case law and legal aspects, control of proprietary information and white collar crime. 3 credit hours.

CJ 310 Criminal Justice Institutions
Prerequisite: CJ 300. Examination of the societal and psychological implications of various types of institutions. Includes both social and total institutions and examines their similarities and dissimilarities with particular emphasis on their implications for criminal justice. 3 credit hours.

CJ 311 Criminology
Prerequisites: CJ 100, P 111, SO 113. An examination of principles and concepts of criminal behavior; criminological theory; the nature, extent and distribution of crime; legal and societal reaction to crime. 3 credit hours. (Same course as SO 311.)

CJ 312 The Police and Crime Control
Prerequisite: CJ 100. The changing role, perspectives and operational strategies of policing as they relate to the crime control function of the police. The focus will be on innovative, promising, emerging or "futuristic" and often highly controversial police practices, programs and approaches to law enforcement as well as on selective community crime prevention efforts undertaken in conjunction with, under the auspices of or independently from the police department. Special attention will be devoted to police brutality, the use of deadly force and its consequences, including high-speed police pursuits. 3 credit hours.

CJ 315 Domestic Violence
Introduction to the study of family violence issues. Typology and history of family abuse, responses to family violence and public policy issues will be the focus of study. Issues in domestic violence, sexual abuse, emotional abuse, elder abuse, child abuse, treatment approaches and legal guidelines. 3 credit hours.

CJ 333 Police Civil Liability
Prerequisites: CJ 100, CJ 102, CJ 217 or permission of instructor. Introductory overview of types of civil liability lawsuits brought against law enforcement officers. Exploration of ways to relieve the pressures of this potential liability. Emphasis placed on negligence and intentional torts. 3 credit hours.

CJ 340 Comparative Criminal Justice
Affords students the opportunity to explore a number of foreign systems with emphasis on policing. Different perspectives of crime problems will be looked at through the prism of foreign culture. 3 credit hours.

CJ 400 Criminal Justice Problems Seminar
Prerequisites: CJ 100, CJ 300. An examination of theoretical and philosophical issues affecting the administration of justice: the problems of reconciling legal and theoretical ideals in various sectors of the criminal justice system with the realities of practice. 3 credit hours.

CJ 402 Police in Society
Prerequisites: CJ 100, CJ 300. Acquaints students with the major developments and trends of policing in a free society. Emphasis placed on American police and the role of the police in a democracy. Further emphasis placed on the examination of the interactions between the police and the commu-

nities they serve. 3 credit hours.

CJ 403 Advanced Forensic Science I with Laboratory
In-depth examination of blood grouping procedures for red cell antigens, isoenzymes and serum proteins, identification and typing of body fluids and their stains; collection, processing and handling of biological materials in casework. Laboratory fee; 4 credit hours.

CJ 404 Advanced Forensic Science II with Laboratory
In-depth examination of several subjects in modern criminalistics, including hair and fiber analysis and comparison, arson accelerants and explosives residues, glass comparisons and forensic chemistry. Laboratory fee; 4 credit hours.

CJ 408 Correctional Counseling I
Prerequisites: P 111, P 336, CJ 205, CJ 209, CJ 301. Basic counseling and evaluation theory, methods and research as applied to a correctional setting. 3 credit hours.

CJ 409 Correctional Counseling II
Prerequisite: CJ 408. Applications of correctional counseling theory and methods. Includes interviewing techniques and case intervention strategies with offenders. Focuses predominantly on one-to-one counseling situations. 3 credit hours.

CJ 410 Legal Issues in Private Security
Examines legal problems affecting the private security industry and ways to prevent loss from litigation. Includes intentional torts, negligence, agency, contracts and law of arrest, search and seizure, and interrogation by citizens. 3 credit hours.

CJ 411 Victimology
Introduction to the principles and concepts of victimology, analysis of victimization patterns and trends, and responses to criminal victimization. 3 credit hours.

CJ 412 Substance Abuse and Addictive Behavior
Course provides an overview of drug use and addictive behavior as it relates to law enforcement and correctional treatment issues; current estimate is that 80-90% of violent crime in the United States is correlated with alcohol and drug use. 3 credit hours.

CJ 413 Victim Law and Service Administration
Prerequisite: CJ 411. Introduces the study of crime victims' legal rights and the services system available to crime victims within the criminal justice system and in other settings. Topics include victim assistance programs from law enforcement through the courts and corrections systems as well as community-based advocacy and support. This study of victim services is integrated with a focus on the underlying legal structure of crime victim statutory and constitutional rights including notification, participation, protection and financial remedies (e.g., restitution, compensation and civil litigation) as well as other rights. Practical program management, evaluation and funding issues are incorporated. 3 credit hours.

CJ 414 Legal Rights of Crime Victims
Prerequisite: CJ 100. Introduces the study of crime victims' rights within the justice system. Topics include victim-witness programs, victim impact statements, victim notification laws, compensation schemes and victims' rights legislation. 3 credit hours.

CJ 416 Seminar in Forensic Science
Prerequisites: CJ 201, CJ 215. An examination and evaluation of current issues in the law enforcement science field. Course aids in understanding how various physical evidence can be utilized as an investigative tool. Also, a review of modern analytical techniques and their application in law enforcement science. 3 credit hours.

CJ 420 Advanced Investigative Techniques
Prerequisites: CJ 201, CJ 215, CJ 218 and junior/senior standing. An in-depth study of the principles and techniques associated with the collection and documenting of information obtained during an investigation. Addresses the many sources of information, utilization of informants, the use of hypnosis, polygraph, advanced strategies for interviews and investigations, and provides documentation techniques. 3 credit hours.

CJ 440 Death Investigation—Scene to Court
Prerequisites: senior standing as Criminal Justice or Forensic Science major plus CJ 201, CJ 215 and CJ 415 or permission of instructor. An in-depth study of the principles and techniques associated with investigating homicides; suicides; and accidental, natural or equivocal deaths. While considering the sociological, psychological and legal aspects typically found in these cases, the process will take the student from the scene to the court--criminal or civil. 3 credit hours.

CJ 450-454 Special Topics
A study of selected issues of particular interest to the students and instructor. 3 credit hours.

CJ 498 Research Project
Prerequisite: consent of the department chair. The student carries out an original research project in a criminal justice setting and reports the findings. 3 credit hours.

CJ 500A Criminal Justice Pre-Internship
Prerequisite: senior standing in CJ. A course designed to assist students to gain full understanding and appreciation of the internship experience. Students will be ac-quainted with work rules in criminal justice agencies and helped to select the correct internship for their particular interest. A key issue will be extended discussion of criminal justice ethics as related to the various aspects of the criminal justice system. Students are re-quired to complete the CJ 500A course prior to enrolling in the CJ 500B internship experience. 2 credit hours.

CJ 500B Criminal Justice Internship
Prerequisite: CJ 500A and consent of department chairperson. Provides academically monitored field experience with selected federal, state or local criminal justiced agencies with faculty supervision, guidance and review. The course will include a required classroom discussion meeting(s) to facilitate a better understanding of the issues presented during the internship experience. 3 credit hours.

CJ 502 Forensic Science Internship
Prerequisite: junior/senior standing. Provides academically supervised, real-world experience for forensic science majors. The internship usually constitutes the only practical experience in an actual casework lab that students have during the forensic science program, and it provides a valuable asset to the student in the job market. 3 credit hours.

CJ 520 Computer Crime: Legal Issues and Investigation Procedures
Prerequisite: consent of instructor. An overview of computer crime and the procedures forensic computing specialists, law enforcement investigators and prosecutors must invoke to prosecute computer criminals successfully. 3 credit hours.

CJ 522 Computers, Technology and Criminal Justice Information Management Systems
Prerequisite: consent of instructor. An introduction to information systems used within the criminal justice system. Overview of existing criminal justice information systems with implications for future needs. Analysis of the impact of science and technology on criminal justice agencies. 3 credit hours.

CJ 523 Internet Vulnerabilities and Criminal Activity
Prerequisite: consent of instructor. This course provides appropriate strategies for the proper documentation, preparation and presentation of investigations involving the Internet and familiarizes students with legal information which impacts Internet investigations. 3 credit hours.

CJ 524 Network Security, Data Protection and Telecommunication
Prerequisite: consent of instructor. A comprehensive introduction to network security issues, concepts and technologies. The core technologies of access control, cryptography, digital signatures, authentication, network firewalls and network security services are reviewed along with issues of security policy and risk management. 3 credit hours.

CJ 525 Information Systems Threats, Attacks and Defenses
This course provides an overview of the actors, motives and methods used in the commission of computer-related crimes and describes the methods used by organizations to

prevent, detect and respond to these crimes. 3 credit hours.

CJ 526 Firewall and Secure Enterprise Computing
This course covers theory and practices of Internet firewalls and many of the details and vulnerabilities of the IP and embedded protocol sites. In the laboratory and on-line portion of the course students will construct, deploy and test a real firewall against common Internet attacks. 3 credit hours.

CJ 527 Internet Investigations and Audit-Based Computer Forensics
Theory and techniques for tracking attackers across the Internet and gaining forensic information from computer systems. The course includes case studies of Internet-based crimes and addresses limits of forensic techniques. 3 credit hours.

CJ 528 Computer Viruses and Malicious Code
This course addresses theoretical and practical issues surrounding computer viruses. 3 credit hours.

CJ 529 Practical Issues in Cryptography
Practical issues in cryptography, including examples of current historical cryptography and stegonagraphic systems; major types of cryptosystems and cryptanalytic techniques, and how they operate; hands-on experience with current cryptographic technology. 3 credit hours.

CJ 599 Independent Study
Prerequisite: consent of department chair. An opportunity for the student, under the direction of a faculty member, to explore and acquire competence in a special area of interest. 1-3 credit hours.

CHEMICAL ENGINEERING

CM 201 Fundamentals of Chemical Engineering I
Prerequisites: CH 116, CS 110, M 117. Corequisites: CS110, PH 150. An introduction to the profession of chemical engineering and the application of fundamental chemical, physical and mathematical concepts to the solution of chemical engineering problems. Topics include data analysis, physical property estimation, material balances, stoichiometry with single/multiple reactions and recycle calculations. 3 credit hours.

CM 202 Fundamentals of Chemical Engineering II
Prerequisite: CM 201. A continuation of CM 201 with emphasis on the use of energy balances for both nonreactive and reactive processes. Combined material and energy balances are used in solving a variety of chemical engineering problems. 3 credit hours.

CM 301 Transport Phenomena Analysis
Prerequisites: M 204, CM 202, PH 150. A unified treatment of the fundamentals of momentum and heat transfer with an introduction to mass transfer. Use of microscopic and macroscopic balances, continuity and Navier-Stokes principles and turbulent flow theories to develop mathematical models of physical systems with applications in fluid mechanics and thermal energy transport. 3 credit hours.

CM 310 Transport Operations I with Laboratory
Prerequisite: CM 301. Application of transport phenomena principles to systems involving momentum and heat transfer with emphasis on equipment design. Topics include design of piping systems, flow instruments, filters, heat exchangers, evaporators and others of current interest. Laboratory work includes experiments in fluid flow and heat transfer, computer simulation, oral and written reports. 4 credit hours.

CM 311 Chemical Engineering Thermodynamics
Prerequisite: CH 331, CM 202. Applications of the first and second laws of thermodynamics to batch and flow processes important in chemical engineering for homogeneous and heterogeneous systems, mixtures and pure materials. Topics include phase and chemical equilibria, chemical reactions, thermochemistry, thermodynamic properties and miscibility. 3 credit hours.

CM 321 Reaction Kinetics and Reactor Design
Prerequisites: CM 202, M 204. Homogeneous and heterogeneous catalyzed and noncatalyzed reaction

kinetics for flow and batch chemical reactors. Application of kinetic data to both isothermal and nonisothermal reactor design. This course is intended for both chemists and chemical engineers. 3 credit hours.

CM 401 Mass Transfer Operations
Prerequisite: CM 301. The fundamentals of diffusion and mass transfer in solids, liquids and gases applied to the analysis and design of process operations. Topics include: Fick's law, mass transfer coefficients, interphase transfer, gas absorption, adsorption, humidification and drying. Emphasis is placed on the design of industrially important equipment. 3 credit hours.

CM 410 Transport Operations II with Laboratory
Prerequisites: CM 310, CM 401. Application of transport phenomena principles to systems involving momentum, heat and mass transfer with emphasis on equipment design. Topics include design of staged separation equipment for distillation, extraction and leaching, membrane systems, crystallization and others of current interest. Laboratory work includes experiments in mass transfer, reactor systems, computer simulation, oral and written reports. 4 credit hours.

CM 420 Process Design Principles
Prerequisites: CM 310, CM 311, CM 321, IE 204. Corequisites: CM 401, CM 410. Study and application of principles needed in the design of process systems. Topics include: cost estimation, hazard and safety analysis, ethical concerns, preliminary design techniques, optimization, computer-aided design (using ASPEN PLUS), alternative designs and technical reports. Methods include team and individual assignments, oral and written presentations. 3 credit hours.

CM 421 Plant and Process Design
Prerequisites: CM 410, CM 420 and senior status. A capstone course in the design of processing plants and equipment, applying principles from transport operations, thermodynamics, kinetics and economics. Students work individually and in groups to develop flowsheets, select equipment, specify operating conditions and analyze designs from technical, economic and safety perspectives. Extensive report writing and oral presentations. 3 credit hours.

CM 431 Process Dynamics and Control with Laboratory
Prerequisites: EE 201, M 204, CM 310. Fundamental principles of chemical process dynamics used in the measurement and control of process variables such as temperature, pressure and flow rate. Development of linear and nonlinear dynamic process models, stability analysis and control system design using analytical and computer methods. Laboratory assignments stress the analysis, design and tuning of process loops using computer simulations and industrial control equipment on pilot-scale process equipment. Students gain experience using industrial control hardware such as programmable logic controllers and distributed control systems. 4 credit hours.

CM 450-455 Special Topics in Chemical Engineering
Prerequisite: consent of instructor. Intensive study of some aspects of chemical engineering not covered in the more general courses. 1-4 credit hours.

CM 501/502 Senior Project I and II
Prerequisites: senior status and consent of course instructor (faculty adviser) and program director. Student should propose an original, significant problem or theory. The investigation should include at least two of the following elements: theoretical analysis, mathematical or computer modeling, optimal design methods or laboratory experimentation. Weekly conferences with adviser, final written and oral report with format to be determined by faculty adviser. 3 credit hours per term.

CM 521 Air Pollution Fundamentals
Prerequisite: permission of instructor. An introduction to the sources of air pollution, the transport of gaseous and particulate pollutants in the atmosphere on local and global scales, transformations of pollutants by atmospheric processes, the impact of pollutants on the environment, the control of sources of air pollution and legislative mandates. Introduction to meteorological concepts and computer transport models. Current

issues such as ozone depletion and global warming will also be discussed. 3 credit hours.

CM 599 Independent Study
Prerequisites: consent of faculty supervisor and program director. Opportunity for the student, under the direction of a faculty member, to explore an area of personal interest. Weekly conferences with supervisor, final written (and possibly oral) report, format to be determined by faculty supervisor. 1-4 credit hours.

COMMUNICATION

CO 100 Human Communication
Competencies and skills needed to communicate effectively in varied personal, relational and professional contexts. Communication process, verbal/nonverbal communication, listening, persuasion, conflict management and group decision making are studied in interpersonal, public, mass and organizational settings. Students are assisted in developing skills appropriate to real-life situations. Recommended for all students regardless of major. 3 credit hours.

CO 101 Fundamentals of Mass Communication
Corequisite: CO 100. Introduction to the mass media of newspapers, film, magazines, radio, television, trade publications and public relations. Course emphasizes media's impact on society. 3 credit hours.

CO 102 Writing for the Media
A study of drills and exercises in writing television and radio news, news releases, speeches, public service announcements and film documentaries. Emphasis is placed on firsthand practical experience assignments and criticism of completed copy. 3 credit hours.

CO 103 Audio in Media
Concerned with sound as used in radio, television and film. Course entails lectures, demonstration and lab practice of sound production and transmission. Laboratory fee; 3 credit hours.

CO 109 Communication for Management and Business
Prerequisite: CO 100. Introduction to the concepts and skills needed to communicate effectively in business and professional settings. Students develop communication competency by focusing on communication activities common to business and service organizations. Interpersonal communication, group and meeting communication, listening skills, interviewing, speeches, public and instructional presentations, and negotiation are stressed. 3 credit hours.

CO 114 Production Fundamentals
Introduction to theory and technique in sound and video media. Several team projects will provide a fundamental production orientation in each medium as well as provide the environment to discuss goals and objectives of production. Laboratory fee; 3 credit hours.

CO 200 Theories of Group Communication
Prerequisite: CO 100. Focus is on the dynamics of communication and group processes including leadership styles, team building, task and maintenance functions, problem-solving and decision-making, and conflict management. Students develop communication skills through class activities designed to maximize effective decision-making and evaluation. 3 credit hours.

CO 203 Radio Production
Prerequisite: CO 103 or permission of instructor. Theory and practice of techniques involved in the function and operation of a radio station. Microphone techniques, engineering operations, transmitter readings, logging and programming will be included. Laboratory fee; 3 credit hours.

CO 205 Intercultural Communication
Prerequisite: CO 100. A theoretical and practical survey of intercultural communication processes. This course is concerned with the interpersonal dimensions of intercultural communication and will examine the distinctive cultural orientations, behaviors, expectations and values that affect communication situations. 3 credit hours.

CO 208 Introduction to Broadcasting
Prerequisite: CO 101. General survey and background of broadcasting, cable, pay and premium TV services and new technologies. Current changes, law, regulation,

financing and public input are examined. Emphasis is placed on current status and future potential of these industries. 3 credit hours.

CO 212 Television Production I
Prerequisite: CO 114 or permission of instructor. Introduction to the mechanics, techniques and aesthetic elements of television production. Course provides the basic grounding in the art and craft of the medium. Laboratory fee; 3 credit hours.

CO 214 Elements of Film
Prerequisite: CO 114 or permission of instructor. Stresses the understanding of film as a creative form of communication. Student is introduced to basic techniques of motion picture production through lectures, audiovisual activity and small group involvement. Laboratory fee; 3 credit hours.

CO 220 Film Production I
Prerequisite: CO 214. Involves the transformation of an original idea into film: Initial analysis, proposed treatment plan, sequencing, film scripting, preproduction planning, nature of the production process. A short film is produced through team effort. Laboratory fee; 3 credit hours.

CO 300 Persuasive Communication
Prerequisite: CO 100. Study of communication as social influence. Analysis of theories of attitude change. The use and effects of compliance-gaining strategies in interpersonal, public and mass communication contexts. Students develop, present and analyze persuasive messages. 3 credit hours.

CO 301 Communication Theory and Research
Prerequisite: junior status. Acquaints students with the nature of communication inquiry. Theories of communication effects are surveyed. Research methodologies relevant to advertising, journalism, broadcast media, public relations and organizational communication settings are examined. 3 credit hours.

CO 302 Social Impact of Media
Prerequisite: CO 101. Examines such problems as regulatory control of the media, law and ethics, and the behavioral aspects of mass and interpersonal communication. Students examine the variety of media writing and commence writing their own media messages. 3 credit hours.

CO 306 Public Relations Systems and Practices
This course makes students aware of the depth and sensitivity of the role public relations plays in today's business environment. Orients students to career paths utilizing communication, journalistic and management skills as well as skills acquired in business and English courses. Use of the lecture/discussion, case study and guest speaker approach to teach all students the historical, theoretical, practical and technical applications of public relations. 3 credit hours.

CO 308 Broadcast Journalism
Prerequisite: CO 102. Entails practice in news gathering, editing, writing, and use of news services and sources. Creating documentary and special event programs through film for television news, on-the-spot film and video-tape reporting are included. 3 credit hours.

CO 309 Public Relations Writing
Prerequisite: CO 102. Examines the elements of good writing as applied to the public relations field. Students research and identify general and specialized audience needs and create messages to satisfy those needs. They plan and execute projects within selected media such as newspapers, magazines, TV, radio and film, as well as speeches for public appearances. 3 credit hours.

CO 310 Pictorial Journalism
The study of photography and media design as an active observation and interpretation of events in the print media. 3 credit hours.

CO 312 Television Production II
Prerequisite: CO 212. An intermediate course designed to provide the student with the opportunity to coordinate the many areas of TV production. Videotape and live production techniques are employed. Laboratory fee; 3 credit hours.

CO 317 Advanced Writing for the Media
Prerequisite: CO 102. Planning and writing longer forms of scripts, emphasizing documentary and dramatic writing for production. 3 credit hours.

CO 320 Film Production II

Prerequisite: CO 220. The creative process involved in translating the screen play into a narrative film is explored. Narrative form, structure and production technique are examined through examples of short and feature length films. Students produce short narrative films by team effort. Laboratory fee; 3 credit hours.

CO 335 Advertising Media
Prerequisite: MK 307. This course covers the characteristics of major media and the impact of advertising on the demand for products and services. It will provide students with a critical study of communication principles and concepts as applied to advertising copy. Emphasis will be on how consumers use media; media planning and evaluation; copywriting styles; coordination of visual and verbal concepts; and the principle problems of building, implementing and evaluating advertising programs. 3 credit hours.

CO 340 The History of Film
A survey of the historical development of the film medium consisting of lectures, discussions and the screening of films which demonstrate the interrelationships between the historical development and the establishment of the film medium as a powerful communicative art form. Laboratory fee; 3 credit hours.

CO 399 Media Campaigns
Examines the role played by the mass media in political campaigning. Students look at historical perspectives and study current trends. FCC laws regarding advertising, lowest unit cost, section 315 and other regulations will be examined. Students view videotapes of past political media campaign examples and have the opportunity to participate in and produce hypothetical political media campaigns. 3 credit hours.

CO 400 Communication in Organizations
Communication examined in formal organizational contexts such as school, industry, hospitals and government. Students will be prepared to function more effectively in organizations' dynamic communication systems, and to solve problems relative to the interaction of organizations with the environment via the interactions of people and messages. 3 credit hours.

CO 410 Management Communication Seminar
Open to all upper division students, regardless of major. Involves structure and function of communication in organizations. Practice in understanding and managing interpersonal differences. Emphasizes concepts and principles needed for effective management of organizational communication processes. 3 credit hours.

CO 412 Advanced Television Production
Prerequisite: CO 312. Essentials of budgeting, marketing and regulatory policies and rules. Production teams are formed to produce sophisticated local television programs under close supervision. 3 credit hours.

CO 415 Broadcast Management
Prerequisite: CO 302. Involves the administrative and personnel problems of television and radio studio management, broadcast engineering, local sales, continuity and programming. Discussions will in-clude scheduling and the development of facilities. 3 credit hours.

CO 420 Communication and the Law
Prerequisite: junior status. This course will trace the freedom and control of the print, broadcast, cable and telecommunications industries, and the effect on the public. 3 credit hours.

CO 435 Advertising Seminar
Prerequisites: CO 335 and senior standing. Strategic approaches to managing an advertising campaign related to a specific area, topic or product are developed. Emphasis on market research, determining consumer target markets, media selection, creation of copy, development and control of budgets, and evaluation and presentation of advertising. 3 credit hours.

CO 440-454 Special Topics
Special topics in communication which are of special or current interest. 3 credit hours.

CO 500 Seminar in Communication Studies
This capstone course will integrate the current and developing trends with the individual student's interest and perspectives. Students will

present for discussion and examination issues of interest within a unifying theme. 3 credit hours.

CO 598 Internship
On-the-job learning in selected organizations in production, public relations, journalism or advertising. 3 credit hours.

CO 599 Independent Study in Communication
Prerequisite: consent of faculty member and department chair. Opportunity for the student under the direction of a faculty member to explore an area of interest. 1-3 credit hours per semester with a maximum of 6 credit hours.

COMPUTER SCIENCE

CS 107 Introduction to Data Processing
Concepts underlying modern application of computer systems. Windows, word processing, spread sheets, databases. *Not to be taken for credit by computer science majors.* 3 credit hours.

CS 110 Introduction to C Programming I
Prerequisite or corequisite: M 117. A first course in computer programming using the C language; for engineering, computer science, mathematics and science studenrs. Problem solving methods, algorithm development and good programming style. Expressions, functions, libraries, basic types and arrays. Programming assignments will stress numeric applications. 2 credit hours.

CS 111 Introduction to C Programming II (for non-CS majors)
Prerequisite: CS 110. Further topics in C language programming *for non-computer science majors.* Problem solving methods, algorithm development and good programming style. Strings, structured data, two dimensional arrays, files, parameter passing mechanisms. Program-ming assignments will stress numeric applications. 1 credit hour.

CS 112 Introduction to C Programming II
Prerequisite: CS 110. Further topics in C language programming *for computer science majors.* Problem solving methods, algorithm development and good programming style. Strings, structured data, two-dimensional arrays, files, recursion, dynamic memory allocation, parameter passing mechanisms and the use of pointers to process arrays. Basic algorithms for searching, sorting and simple numerical analysis. Programming assignments will include both numeric and nonnumeric applications. 2 credit hours.

CS 166 Fundamentals of Digital Computing
Prerequisite: CS 110. A foundation course for computer science majors. Introduction to fundamentals including logic, sets, functions, induction, internal computer representations and computational properties of numbers. 3 credit hours.

CS 226 Data Structures and Algorithms I
Prerequisites: CS 112 and CS 166. Program design and debugging techniques. Data structures and their applications: linked lists, stacks, queues, priority queues, trees. Recursion. Sorting and hashing algorithms. Type semantics, type conversions and union data types. Substantial programs will be written in C. 3 credit hours.

CS 228 Intensive FORTRAN
Prerequisite: CS 111 or CS 112. The syntax, semantics and idiosyncrasies of the FORTRAN language, taught by analogy to and contrast with C. Several short programs will be written in FORTRAN. 1 credit hour.

CS 310 Computing Theory
Prerequisite: CS 226. Central topics in theory of computation including: algebraic methods, proof procedures and formal systems. Regular expressions, formal languages, grammars, the Chomsky hierarchy, finite automata, pushdown automata, decidability, Turing machines and other formal computer models. Elementary complexity theory. 3 credit hours.

CS 314 Computer Organization
Prerequisite: CS 226. The structure and function of computers. The nature and characteristics of modern computer systems and the operation of individual components—CPU, control unit, memory units and I/O devices. Topics

include addressing methods, machine-program sequencing, microprogramming, complex I/O organization, interrupt systems, multiple-module memory systems and caches, peripheral devices, microprocessors and pipelined computers. 3 credit hours.

CS 320 Operating Systems
Prerequisite: CS 314, or EE 371 as a prerequisite and EE 472 as a corequisite. Modern operating system concepts including: interrupts, process management, concurrency, deadlock, memory management, file system management, resource allocation. 3 credit hours.

CS 326 Data Structures and Algorithms II
Prerequisite: CS 226. Data structures–trees, graphs, hash tables. Recursive techniques–divide and conquer, backtracking, recursion elimination. Algorithms–sorting, searching, garbage collection, storage management, shortest paths. Analysis of the complexity of algorithms. Some programming will be required. 3 credit hours.

CS 330 Systems Programming/C
Prerequisite: CS 320 or EE 371. Techniques for systems programming in the C language. Topics include data structures for system implementation, data compaction algorithms, macro preprocessors, conditional compilation, low-level interface programming, UNIX system calls including file operations and process control, and client-server routines. Programming projects required. 3 credit hours.

CS 337 File Structures
Prerequisite: CS 326 or CS 330. Design, implementation, selection and use of computer files for external storage of data. Programming projects required. 3 credit hours.

CS 338 Structure of Programming Languages
Prerequisite: CS 310 and competence in two computer languages. Computer language components—their specification, semantics, implementation and internal operation. The structure, syntax and semantic aspects of several languages are examined. Short programs are required in two new languages. 3 credit hours.

CS 416 Computer Ethics
Prerequisite: junior or senior standing. A critical examination of ethical theories and their application to the uses of computers and information technology. Issues include professional ethics, privacy, responsibility, access, property rights, computer crime and social implications. (See also PL 416.) 1 credit hour.

CS 420 Software Design and Development
Prerequisite: senior standing in computer science. Application and extension of ideas and skills from preceding courses. Formal methods for design optimization and debugging. Interfacing with users and with the computing environment. A large project will be designed and implemented. 3 credit hours.

CS 425 Principles of Computer Graphics
Prerequisites: M 118 and CS 226. Development and implementation of the fundamental algorithms of computer graphics: 2-D viewing, geometric transformations, clipping, segmentation, curves, user interaction. Introduction to 3-D viewing and surfaces. Programming projects required. 3 credit hours.

CS 434 Assembly Language
Prerequisite: CS 314. Introduction to assembly language programming, including study of instruction types, the hardware instruction set, assembly language syntax and features, explicit use of memory, macros, subprograms, interrupts, I/O conversions. Major functional characteristics of the computer and its peripherals. Programming projects required. 3 credit hours.

CS 437 Database Systems
Prerequisite: CS 320 or CS 326. Overview of database systems. Purpose, structure, capabilities, use. Introduction to typical systems and their internal operation. Design and implementation of relational databases. 3 credit hours.

CS 439 Theory and Construction of Compilers
Prerequisites: CS 310 and CS 434. Assemblers, interpreters and compilers. Finite state machines and their application to lexical analysis. Parsing, syntactic analysis and P-code. Semantic analysis, code generation and optimization. Programming may be required. 3 credit hours.

CS 440 Programming Laboratory
Prerequisite: junior or senior standing in computer science, consent of faculty superviser and approval of program coordinator. The student will write a large program or a series of programs. Projects will be an extension of the course materials of one of the junior/senior courses. Course may be taken repeatedly, up to three times, working in different languages or doing more advanced projects. 1 credit hour.

CS 447 Computer Communications
Prerequisites: CS 314 or EE 472 and any one of the following: ES 345 or IE 346 or M 371 or EE 320. Problems and solutions in network design. Layered models, network topology, protocols, virtual circuits and packet switching, local networks (CSMA, token ring, ethernet), security (DES, public key crypto-systems), Internet protocols, client/server programming, sockets. 3 credit hours.

CS 450-457 Special Topics
Prerequisite: junior or senior standing in computer science. New developments or current practices in computer science. 3 credit hours.

CS 478 Artificial Intelligence
Prerequisite: CS 226. The concepts, syntax and procedures of a functional language (LISP or a derivative of LISP such as Scheme). Methods and present capabilities of artificial intelligence. Topics: general search strategies, heuristics, game trees, knowledge representation, propositional and first-order logic, inference, probabilistic reasoning, planning and expert systems. 3 credit hours.

CS 504 Senior Project
Prerequisite: senior standing in computer science, consent of faculty superviser and approval of program coordinator. A project is selected and carried out in conjunction with the faculty adviser. Work is presented at a seminar at the end of the term. 3 credit hours.

CS 526 Object-Oriented Principles and Practice/C++
Prerequisite: CS 330 or permission of instructor. The C++ language; object-oriented design and programming. Protection of privacy, encapsulation of data with relevant functions. Advanced aspects of C++; inheritance, templates, polymorphism, virtual functions and exception handling. Several programming projects in C++. 3 credit hours.

CS 528 Object-Oriented Software Development
Prerequisite: CS 526. An object-oriented design methodology course taught in the C++ language. Topics: object-oriented system analysis, design and implementation. Various design methodologies and their use during the development of a software project. Students will design a major project and implement portions using C++. 3 credit hours.

CS 551 Advanced Computer Graphics
Prerequisite: CS 425. Three-dimensional graphics including surface modeling, transformations, three-dimensional viewing, spline curves and surfaces, color theory and shading, hidden-surface elimination and an introduction to ray tracing. Progamming projects required. 3 credit hours.

CS 599 Independent Study
Prerequisite: junior or senior standing in computer science, consent of faculty superviser and approval of program coordinator. (Refer to academic regulations for independent study). Exploration of an area of interest. Written and oral presentations are normally required. 3 credit hours.

DENTAL HYGIENE

DH 105 Introduction to Dental Hygiene I
Provides entry-level dental hygiene students with an introduction to allied health education and the profession of dental hygiene. 1 credit hour.

DH 110 Introduction to Dental Hygiene II
Prerequisite: DH 105. This course is a continuation of DH 105 and provides students with a survey of contemporary issues encountered by health care workers. Emphasis is placed on professional standards, health promotion, disease prevention and ethical issues that are encountered by dental hygienists.

1 credit hour.

DH 214 Oral Facial Structures
Prerequisites: DH 105, DH 110, and BI 121. This course examines the head and neck region, emphasizing the anatomy of oral facial structures, including the teeth. This course also addresses oral histology and embryology. 4 credit hours.

DH 215 Radiology
Prerequisites: DH 105, DH 110, DH 214, DH 220, and BI 121. This course is an extension of the clinical course sequence and concentrates on the role of radiographs in the diagnosis and treatment of oral diseases. The course emphasizes radiographic characteristics and production, equipment, safety, processing and interpretation. 3 credit hours.

DH 220 Dental Hygiene Concepts I
Prerequisites: sophomore status and DH 105, DH 110. DH 220 is the first in a series of clinical courses; it provides the foundations of clinical dental hygiene practice. The course focuses on: professionalism, ethical decision-making principles, infection control, the impact of tooth accumulated deposits and the development of the knowledge and skills necessary for the delivery of dental hygiene services. Clinical laboratory fee; 3 credit hours.

DH 240 Dental Hygiene Concepts II
Prerequisites: sophomore status and DH 105, DH 110, DH 214, DH 220. This course is an extension of DH 220 and focuses on the continuing development of the knowledge and skills necessary for comprehensive dental hygiene treatment. Classroom sessions emphasize the caries process and the role of oral hygiene adjuncts and preventive products in the management of dental caries and periodontal disease. Clinical laboratory fee; 4 credit hours.

DH 320 Pharmacology and Pain Management
Prerequisites: junior status and required first- and second-year dental hygiene courses. This course provides an overview of medications encountered by health care workers. Particular attention is paid to the impact various medications have on dental and dental hygiene treatment. Medications, local anesthetics and other chemotherapeutic agents utilized in the dental treatment setting will be emphasized. 3 credit hours.

DH 325 General and Oral Pathology
Prerequisites: junior status and required first- and second-year dental hygiene courses. A survey of general pathology with emphasis on the impact of pathologic conditions on the oral cavity Diseases of the gingiva and periodontium and the role of the dental hygienist in recognition and referral will be emphasized. 3 credit hours.

DH 327 Periodontology
Prerequisites: junior status and required first- and second-year dental hygiene courses. This course provides an in-depth examination of periodontal diseases, the immune response, and both surgical and nonsurgical interventions. The role of the dental hygienist as a periodontal co-therapist is emphasized. 3 credit hours.

DH 330 Dental Hygiene Concepts III
Prerequisites: junior status and required first- and second-year dental hygiene courses. Dental Hygiene 330 is a continuation of the clinical course sequence. Content emphasis is placed on instrument sharpening, instrument alternatives, mastery of adjunct utilization, dental specialties and medical emergency protocols. Clinically, students will be treating clients with a broader scope of oral/physical conditions. Clinical laboratory fee; 3 or 5 credit hours.

DH 342 Dental Materials
Prerequisites: DH 330, junior status and required first- and second-year dental hygiene courses. This lecture/laboratory course provides students with an understanding of the biomaterials and techniques utilized in preventive, restorative and surgical dental procedures. Emphasis is placed on the role of the dental hygienist in maintaining and evaluating preventive and restorative materials. 3 credit hours.

DH 350 Dental Hygiene Concepts IV
Prerequisites: required first and second-year dental hygiene courses

and DH 320, DH 325, DH 327, DH 330 and BI 115. DH 350 is the fourth course in the clinical course sequence. The didactic portion of the course concentrates on ethical decision-making skills, problem solving abilities, and practice management principles. Clinically students will have an opportunity to treat more challenging cases. Clinical laboratory fee; 5 credit hours.

DH 423 Instructional Planning and Media
Prerequisites: junior status and required first- and second-year dental hygiene courses. This course provides dental hygiene students and practitioners with an overview of the instructional planning process. Emphasis will be placed on the steps in the process, the development and utilization of media, and oral presentation skills. 3 credit hours.

DH 438 Dental Hygiene Research
Prerequisites: senior status and required first-, second- and third-year dental hygiene courses. This course provides dental hygiene students with the skills needed to understand, interpret and critique professional literature. Emphasis is placed on statistical tests and the design of a sound research protocol. 3 credit hours.

DH 455 Dental Hygiene Public Health
Prerequisites: required first- and second-year dental hygiene courses and DH 320, DH 325, DH 327, DH 330 and BI 115. This course emphasizes the role of dental and dental hygiene public health programs in the health care delivery system. The role of the dental hygienist in community disease prevention and health promotion activities will be stressed. Students will have the opportunity to interact with a broad spectrum of community groups during the field experience aspect of the course. 4 credit hours.

DH 460 Advanced Dental Hygiene Concepts
Prerequisites: required first and second-year dental hygiene courses and DH 320, DH 325, DH 327, DH 330, DH 342, DH 350 and BI 115. The clinical course sequence culminates in DH 460; this course provides the opportunity for students to integrate all the skills and didactic knowledge previously gained. Clinical time will be spent on increasing time efficiency, while maintaining recognized standards of care. Didactic content will focus on professional credentials, state licensing agencies, continuing education, the role of professional organizations, employment goals and resume preparation. Clinical laboratory fee; 5 credit hours.

DH 461 Oral Medicine
Prerequisites: required first and second-year dental hygiene courses and DH 320, DH 325, DH 327, DH 330 and BI 115. Oral Medicine utilizes the content from Anatomy and Physiology, Pharmacology, Oral Pathology, Dental Hygiene Clinic and other courses as the basis for discussing the impact of systemic conditions on the oral cavity. The medical history will be utilized in a case study approach to address the role of the dental hygienist in medical risk assessment and management. 3 credit hours.

DH 462 Dental Hygiene Internship
Prerequisites: junior status and required first- and second-year dental hygiene courses. This course provides senior-level dental hygiene students with the opportunity to apply the knowledge and skills gained throughout the dental hygiene curriculum in an internship experience that is compatible with future career goals. 3 credit hours.

DH 468 Dental Hygiene Senior Project
Prerequisites: senior status and DH 423, DH 438. This course provides the student with the opportunity to design a research protocol for a selected area of dental hygiene research. All previous and current coursework will assist the student to design and present a protocol that will be the basis for a future research study. 3 credit hours.

DH 490-499 Special Topics
Prerequisite: dental hygiene major; specifics of course(s) to be determined in consultation with the program director. Opportunity for the student, under the direction of the dental hygiene faculty, to explore an area of interest. 1-3 credit hours; maximum of 6 credits.

DIETETICS

DI 200 Basic Food Preparation
Introduction to the fundamental concepts, skills and techniques of basic food preparation and baking. Special emphasis is given to the study of ingredients, cooking theories, terminology, equipment, technology, weights and measures. Instruction will include experimental hands-on preparation, demonstration and lecture. Laboratory fee; 3 credit hours.

DI 214 Menu Planning
Principles of meal planning and writing menus for volume food combinations, texture, color, nutrition and cost. The interrelated steps involved in quantity food production, the delivery of food and the responsibilities of management. 3 credit hours.

DI 216 Safety and Sanitation
Basic principles of food sanitation and work safety are stressed. The student will write policies and procedures and conduct an in-service training class for a food service facility in the hospitality field. Emphasis is placed on the causes and prevention of food poisoning and the moral and legal responsibilities of management to present safe and sanitary food to patrons. 3 credit hours.

DI 322 Marketing for Dietetics
An analysis of essential marketing principles as currently applied in the hospitality, tourism and dietetics industries. The hospitality marketing mix will be evaluated in terms of specific applications used in all three industry segments. 3 credit hours.

DI 326 Human Resource Management for Dietetics
Provides the knowledge required to formulate and effectively manage the human resources in a hospitality, tourism and dietetics related operation. Establish the framework for application of management by discussing quality assurance roles, manpower analysis, organizational needs, team building, job designs and recruitment process. 3 credit hours.

DI 330 Dietetic Practice in Today's Society
Prerequisite: BI 115. Introduction to the health team. Emphasis on responsibilities of dietetic service professionals. Provides necessary tools for client assessment and interviewing. Discusses role of quality assurance in dietetic practice. 3 credit hours.

DI 340 Health Concerns and Menu Planning
Acquaints the student with the techniques of menu planning required by today's health-conscious trends. Menus are modified for various institutional settings with emphasis on calories, fat, cholesterol and sodium. 3 credit hours.

DI 342 Food Preparation for the Health-Conscious
Provides knowledge and expertise in creating and redesigning recipes. Incorporates today's healthy eating principles. Emphasis is placed on eating healthy without it costing more. Laboratory fee; 3 credit hours.

DI 400 Leadership in Dietetics
Prerequisite: DI 326. Situational leadership, quality management models, strategic planning, quality assurance, as well as other classical leadership and management models are applied to the hospitality, food service and tourism industries. 3 credit hours.

DI 401 Leadership Applications in Dietetics
Prerequisite: DI 400. Building on the theory presented in DI 400, this course provides the opportunity to apply knowledge of leadership models, concepts and theories through case studies and research projects. A team research project/presentation is the major focus of the course. 3 credit hours.

DI 405 Community and Institutional Nutrition
Emphasizes tools for developing effective dietetic programs in the community. Looks at the organization and development of action plans. Develops knowledge of the fundamentals of the political and legislative process. Discussion of nutritional problems that may be secondary to other health, social and economic influences. 3 credit hours.

DI 450-455/499 Special Topics
Selected topics in dietetics, health care, food service management, team concepts and a variety of current issues. 3 credit hours.

DI 599 Independent Study
Prerequisite: permission of the program coordinator. Independent research projects or other approved phases of independent study. 3 credit hours.

ENGLISH

Note: E 105 and E 110 are required by all departments in the university and must be taken during the student's first year at the university. They are prerequisites for all upper-level, 200 or above, English courses.

E 101 Academic Reading
Reading, analyzing and interpreting nonfiction for the purpose of learning to comprehend textbooks. 3 excess credit hours.

E 103 Fundamentals
Designed to increase awareness of the structure of English. Intensive practice in writing to improve the student's ability to construct effective sentences, paragraphs and short themes. 3 excess credit hours, 6 class hours per week. See section titled Developmental Studies Program elsewhere in this catalog.

E 104 Fundamentals
For international students. Same course description as E 103.

E 105 Composition
Prerequisite: satisfactory grade on English placement test or E 103. Analytical study of essays for the purpose of improving skills of written communication. Practice in writing in a variety of rhetorical modes with emphasis upon clarity and precision. 3 credit hours.

E 106 Composition
For international students. Same course description as E 105.

E 110 Composition and Literature
Prerequisite: E 105 or placement by the English department. Reading, analyzing and interpreting literature in three basic genres: fiction, poetry and drama. Writing of analytical and critical essays. Theatre fee for day sections. 3 credit hours.

E 111 Composition and Literature
For international students. Same course description as E 110.

E 114 Oral Exposition
A disciplined approach to oral communication for freshmen. Objectives are to develop proficiency in locating, organizing and presenting material and to help the student gain confidence and fluency in speaking extemporaneously. Students beyond the freshman year should take E 230. 3 credit hours.

E 201 Literary Heritage
Prerequisite: E 110. Selected classics of prose, poetry and drama from Homer through the Renaissance. 3 credit hours.

E 202 Modern Literature
Prerequisite: E 110. Selected classics of prose, poetry and drama from the seventeenth century to the present. 3 credit hours.

E 211 Early British Writers
Prerequisite: E 110. A study of important British writers from the beginning of literature in English through the Neoclassic era. 3 credit hours.

E 212 Modern British Writers
Prerequisite: E 110. A study of important British writers from the Romantic era to the present. 3 credit hours.

E 213 Early American Writers
Prerequisite: E 110. A study of important American writers from Colonial times to the 1850s. 3 credit hours.

E 214 Modern American Writers
Prerequisite: E 110. A study of important American writers from the 1860s to the present. 3 credit hours.

E 217 African-American Literature
Prerequisite: E 110. Important African-American writers from the late 1700s to 1940. Texts selected with emphasis on the African-American experience and heritage. 3 credit hours.

E 220 Writing for Business and Industry
Prerequisite: E 110. Intensive practice in the various types of writing required of executives, business people, engineers and other profes-

sionals, with emphasis on business letters, memos, resumes, internal and external reports, evaluations and recommendations, descriptions of procedures and processes. 3 credit hours.

E 225 Technical Writing and Presentation
Prerequisite: E 110. Intensive practice in the common forms of technical writing, with emphasis on technical description, processes, reports and manuals. Oral presentation of written work. 3 credit hours.

E 230 Public Speaking and Group Discussion
Prerequisite: E 110. Objectives are to develop proficiency in organizing and presenting material, and to give practice in speaking, group interaction, conference management and small group discussion. 3 credit hours.

E 250 Expository Writing
Prerequisite: E 110. Intensive practice in writing that explains, particularly, the feature article. Emphasis on gathering information, establishing credibility and attaining clarity, coherence and point. Especially helpful to students interested in journalism. 3 credit hours.

E 260 The Short Story
Prerequisite: E 110. A critical study of the best stories of American and British writers as well as stories, in translation, of writers of other nationalities. 3 credit hours.

E 261 The Essay
Prerequisite: E 110. Writing the informal, personal essay. Study of contemporary essays and great essays of the past. Especially helpful to students interested in journalism. 3 credit hours.

E 267 Creative Writing I
Prerequisite: E 110. Exercises and instruction in writing poetry, short fiction and drama. Contemporary models explored; critical and editing skills developed in workshop format. 3 credit hours.

E 268 Creative Writing II
Prerequisite: E 110. Practice in writing poetry, short fiction and drama, with emphasis on the student's choice of genre. *(E 267 is not a prerequisite for E 268).* 3 credit hours.

E 275 Popular Lyrics
Prerequisite: E 110. Popular lyrics have always reflected the shifting values and concerns of American life–from the songs of the Jazz age, the Depression and World War II to rock'n'roll and the music video revolution of today. Through printed lyrics, recordings and videos, such topics as The American Dream, love and relationships, war and protest are traced in the songs of Irving Berlin and Cole Porter along with Ira and George Gershwin; from Broadway to Tin Pan Alley, to the Beatles, Bob Dylan and Paul Simon; from rhythm and blues, and country western, to folk, rock and rap. 3 credit hours.

E 281 Science Fiction
Prerequisite: E 110. A survey of the development of science fiction during the nineteenth and twentieth centuries. Reading of American, English and European science fiction novels and short stories. 3 credit hours.

E 290 The Bible as Literature
Prerequisite: E 110. A study of literary genres in the Bible: narrative, drama, poetry, wisdom literature, books of prophecy, letters. Extensive readings in both the Old and New Testaments. 3 credit hours.

E 300 Writing Proficiency Examination
Prerequisite: E 110. Required of each student after earning 57 credit hours (including transfer credits). See Writing Proficiency Examination statement or contact English Department Chair.

E 323 The Renaissance in England
Prerequisite: E 110. Major writers of the English Renaissance, including Sidney, Spenser, Donne and Milton. 3 credit hours.

E 341 Shakespeare
Prerequisite: E 110. An analysis of representative tragedies, comedies and history plays. 3 credit hours.

E 353 Literature of the Romantic Era
Prerequisite: E 110. Poetry and prose of the major Romantics–Wordsworth, Coleridge, Byron, Shelley, Keats, Lamb and Hazlitt–with attention given to the milieu of the writers, the

Continental background and theories of Romanticism. 3 credit hours.

E 356 Victorian Literature
Prerequisite: E 110. Poetry and prose from 1830-1900. The works of Tennyson, Browning, Arnold, Carlyle, Mill, Newman, Ruskin and others studied in the light of the social, political and religious problems of the period. 3 credit hours.

E 371 Literature of the Neoclassic Era
Prerequisite: E 110. British writers of the period 1660-1789, with emphasis on Dryden, Pope, Swift and Johnson. 3 credit hours.

E 390 The Novel in English
Prerequisite: E 110. Great novels written in English (with the exception of American novels, which are studied in American literature courses). 3 credit hours.

E 392 Poe, Hawthorne and Melville
Prerequisite: E 110. A study of the poetry and fiction of the major representatives of the tragic outlook on life in mid-nineteenth century American literature: Poe, Haw-thorne and Melville. 3 credit hours.

E 394 American Humor
Prerequisite: E 110. An intensive study of the history of American humor and its relevance to modern America. Various media will be studied and major humor writers including Mark Twain and Woody Allen will be studied. This distance learning course is taught on-line, using Internet resources to complement traditional materials. 3 credit hours

E 395 American Realism and Naturalism
Prerequisite: E 110. Readings in the works of such major realists as Howells, Twain and James and important naturalist successors such as Frank Norris, Stephen Crane and Theodore Dreiser. 3 credit hours.

E 406-409 International Literature
Prerequisite: E 110. Selected poetry, drama and fiction, in translation, from one of the following nations: Russia, France, Germany or Spain. Topic to be announced for each semester. 3 credit hours each course.

E 477 American Literature Between the World Wars
Prerequisite: E 110. A study of the achievements of the main figures of the heroic generation that flourished between the two world wars and brought about "America's Coming of Age." Poets Ezra Pound, T.S. Eliot, Robert Frost, Wallace Stevens and William Carlos Williams; novelists Hemingway, Faulkner, Fitzgerald. 3 credit hours.

E 478 Contemporary American Literature
Prerequisite: E 110. Intensive study of recent American fiction, nonfiction, poetry and drama. 3 credit hours.

E 480 Internship
Prerequisite: E 110. A work experience, arranged through the department, that will require the effective use of written or spoken English. 3 credit hours.

E 481-498 Studies in Literature
Prerequisite: E 110. Special topics in literature, which may include a concentration on a single figure, a group of writers or a literary theme. 3 credit hours each course.

E 599 Independent Study
Prerequisites: consent of the instructor and the chair of the department; restricted to juniors and seniors who have at least a 3.0 quality point ratio. Opportunity for the student under the direction of a faculty member to explore an area of interest. This course must be initiated by the student. 1-3 credit hours per semester.

ECONOMICS

EC 100 Economic History of the U.S.
Development of American economic interactions in the various stages of agriculture, trade, industry, finance and labor. Change of economic practices and institutions, particularly in business, banking and labor as well as the changing role of government. 3 credit hours.

EC 133 Principles of Economics I
Foundations of economic analysis, including economic progress,

resources, technology, private enterprise, profits and the price system. Macroeconomics including national income, employment and economic growth. Price levels, money and banking, the Federal Reserve System, theory of income, employment and prices, business cycles and problems of monetary, fiscal and stabilization policy. 3 credit hours.

EC 134 Principles of Economics II
Microeconomics including markets and market structure and the allocation of resources. The distribution of income, the public economy, the international economy and selected economic problems. 3 credit hours.

EC 200 Global Economy
Prerequisites: EC 133, EC 134. This survey provides an understanding of the linkages between the American economy and the rest of the world in a period of increased globalization. Particular emphasis will be placed on understanding the various policies towards international trade and finance, and their relationship to business. 3 credit hours.

EC 250 Economics and U.S. Industrial Competitiveness
Prerequisites: EC 133, EC 134. An examination of the free market and the most effective path to revitalizing the competitiveness of U.S. industry in world markets. Addressed are such key issues as government assistance to industries, regions and workers; regulation and antitrust; dealing with international competition; and promoting trade in services. 3 credit hours.

EC 311 Government Regulation of Business
Prerequisites: EC 133, EC 134 and junior standing. An appraisal of public policy toward transportation, trusts, monopolies, public utilities and other forms of government regulation of economic activity. 3 credit hours.

EC 312 Contemporary Economic Problems
Prerequisites: EC 133, EC 134 and junior standing. Selected current economic problems: inflation, unemployment, poverty in an affluent society, economic issues in health services, the economics of higher education and the problems of the cities and population. Examination and exploration of policies to cure these problems. 3 credit hours.

EC 314 Public Finance and Budgeting
Prerequisites: EC 133, EC 134 and junior standing. A general survey of government finance at the federal, state and local levels, including government expenditures, principles of taxation, public borrowing, debt management and fiscal policy for economic stabilization. 3 credit hours.

EC 336 Money and Banking
Prerequisites: EC 133, EC 134 and junior standing. Nature and function of money, commercial banking system, Federal Reserve System and the Treasury, monetary theory, financial institutions, international financial relationships, history of money and monetary policy in the United States and current problems of monetary policy. 3 credit hours.

EC 340 Microeconomic Analysis
Prerequisites: EC 133, EC 134 and junior standing. Study of commodity and factor pricing, theory of production, cost theory, market structures under perfect and imperfect market conditions. 3 credit hours.

EC 341 Macroeconomic Analysis
Prerequisites: EC 133, EC 134 and junior standing. An investigation of the makeup of the national income and an analysis of the factors that enter into its determination. The roles of consumption, investment, government finance and money influencing national income and output, employment, the price level and rate of growth and policies for economic stability and growth. 3 credit hours.

EC 342 International Economics
Prerequisites: EC 133, EC 134 and junior standing. The role, importance and currents of international commerce; the balance of international payments; foreign exchange and international finance; international trade theory; problems of payments adjustment; trade restrictions; economic development and foreign aid. 3 credit hours.

EC 350 Economics of Labor Relations
Prerequisites: EC 133, EC 134 and junior standing. History of the union movement in the United States, union structure and govern-

ment, problems of collective bargaining, economics of the labor market, wage theories, unemployment, governmental policy and control and problems of employment security. 3 credit hours.

EC 420 Applied Economic Analysis
Prerequisites: EC 133, EC 134 and junior standing. A study of applied economics involves application of the tools of economic analysis to the real-life problems of business firms, government agencies and other organizations. 3 credit hours.

EC 440 Economic Development
Prerequisites: EC 133, EC 134 and junior standing. Economic problems of developing countries and the policies necessary to induce growth. Individual projects required. 3 credit hours.

EC 442 Economic Thought
Prerequisites: EC 133, EC 134 and junior standing. The development of economic doctrine from mercantilism and Adam Smith to Marx and to the thinking of modem-day theorists, such as Friedman, Galbraith, Schumpeter and Debreu. Emphasis upon the main currents of thought with the applicability to present-day problems. Individual study and reporting. 3 credit hours.

EC 598 Internship
Prerequisite: EC 133, EC 134 and junior standing. On-the-job learning in selected organizations in areas related to the student's major. 3 credit hours.

EC 599 Independent Study
Prerequisite: EC 133, EC 134 and junior standing. Independent research projects or other approved forms of independent study. 3 credit hours.

ELECTRICAL ENGINEERING

EE 201 Introduction to Electrical Circuits
Prerequisite: M 117. Corequisites: M 118, PH 205. Energy effects and ideal circuit elements, independent and dependent sources; Ohm's Law and Kirchhoff's Laws; resistive networks; node and mesh analysis; Thevenin and Norton Theorems, maximum power transfer, analysis of first order networks; introduction of sinusoidal steady state, phasors, impedance, admittance. DC and transient analysis using SPICE. 3 credit hours.

EE 202 Network Analysis
Prerequisites: EE 201, M 118. Continuation of EE 201. Analysis and design of networks in sinusoidal steady state. Use of phasors and phasor diagrams, voltage and current gain, resonance, watts, VARS, power factor. Average and RMS values. Maximum power transfer. Mutual inductance, ideal transformers, Fourier series, use of SPICE in steady state analysis and design. 3 credit hours.

EE 206 Electronic Materials and Devices
Prerequisites: M 203, PH 205. Corequisite: M 204. Semi-conductor materials including doping, conduction, diffusion, p-n junction effects. Hall effect and quantum theory. Diode current-voltage relation, diode capacitance and breakdown; FET and BJT operation. Magnetic properties of matter. 3 credit hours.

EE 212 Principles of Electrical Engineering
Prerequisite: EE 201. Digital logic systems. The binary number system, binary arithmetic, decimal to binary conversion, binary codes, hexadecimal codes. Boolean algebra. AND, OR, NAND NOR and XOR gates. Combinational logic design. Multiplexer, rom, decoders, and read and write memory. Digital systems. Sequential logic, latches and flip-flops, digital counters, registers, sequential logic design. This course includes several laboratory exercises related to topics covered in EE 201 as well as new topics in EE 212; the course is equally divided between lectures and laboratory. *This course is intended for non-electrical engineering majors. 3 credit hours.*

EE 255 Digital Systems I
Fundamental concepts of digital systems. Binary numbers, Boolean algebra, combinational logic design using gates, map minimization techniques. Use of modular MSI components such as adders, multiplexers, etc. Analysis and design of simple synchronous sequential cir-

cuits, including flip-flops, shift registers and counters. Introduction to VHDL. 3 credit hours.

EE 256 Digital Systems Laboratory
Prerequisite: EE 255. Covers digital systems test instruments. Experiments in combinational and introductory sequential circuits. Software tools; simulators. Schematic capture and introduction to hardware description languages. Design of simple digital circuits. Written and oral laboratory reports. 2 credit hours.

EE 257 Analog Circuits Laboratory
Corequisite for electrical engineering majors: EE 202. Prerequisite for computer engineering majors: EE 201. Laboratory exercises and projects in dc and ac circuits including Ohm's law, Kirchhoff's laws, Mesh and Nodal Analysis, Thevenin's and Norton's theorems, capacitance and inductance measurements, transient behavior of RLC circuits, operational amplifiers and applications. PSPICE and LabView are introduced; written and oral reports are required. Laboratory fee; 2 credit hours.

EE 302 Systems Analysis
Prerequisites: EE 202 and M 204. Continuous-time and discrete-time signal and system properties; linear difference equations; the convolution integral and convolution sum; the Laplace transform; the Z transform; the Fourier transform of continuous-time signals. 3 credit hours.

EE 320 Random Signal Analysis
Prerequisite: EE 302. The elements of probability theory. Continuous and discrete random variables. Characteristic functions and central limit theorem. Stationary random processes, auto correlation, cross correlation. Power density spectrum of a stationary random process. Systems analysis with random signals. 3 credit hours.

EE 341 Numerical Methods in Engineering
Prerequisites: M 203 and a standard programming language. Topics include: solutions of algebraic and transcendental equations by iterative methods; system of linear equations (matrix inversion, etc.); interpolation, numerical differentiation and integration; solution of ordinary differential equations. Scientific and engineering applications. 3 credit hours. (This course is cross listed with M 338 Numerical Analysis.)

EE 344 Electrical Machines
Prerequisite: EE 202. Magnetic fields and magnetic circuits, forces and torques. Theory, characteristics, operation, testing, equivalent circuits, design concepts and applications of direct current and alternating current machines including transformers, synchronous and induction machinery. Design of main dimensions of transformer cores, rotors and stators and armature windings. 3 credit hours.

EE 347 Electronics I
Prerequisite: EE 202. Signals and their frequency spectrum, amplifiers, circuit models for amplifiers, frequency response. Operational amplifiers, ideal op-amps, inverting and noninverting configurations, op-amp circuits. Basic semiconductor concepts, drift currents, the p-n junctions, analysis of diode circuits, Zener diodes. BJT transistors, physical structure and modes of operation, biasing techniques, the BJT as an amplifier, biasing the BJT for discrete circuit design, analysis of the transistor as a switch. Field-effect transistors, structure and physical operation of MOSFETs, voltage-current characteristics of various FETs. FET circuits at DC, the FET as an amplifier. 3 credit hours.

EE 348 Electronics II
Prerequisite: EE 347. Review of FETs. Biasing the FET in discrete circuits, biasing configurations of single stage IC MOS amplifiers, FET analog switches. Differential and multistage amplifiers, the BJT differential pair, biasing in BJT integrated circuits, actively loaded differential pair, MOS differential amplifiers and multistage amplifiers. Frequency response of amplifiers, S domain analysis, poles and zeros, Bode plots, Miller effect, frequency response of differential amplifiers, study of various wide-band amplifiers. Output stages and power amplifiers, Class A, B and AB stages, IC power amplifiers. Analog integrated circuits, complete analysis of 741 op-amp circuit, CMOS op-amps, D/A and A/D converter circuits. 3 credit hours.

EE 349 Electronics Design Laboratory
Prerequisite: EE 348 (may be taken

concurrently). Laboratory exercises and design projects intended to give students practical experience in analog electronics. Experiments include operational amplifiers, diodes, BJTs, FETs, single and multistage amplifier design as well as open ended design projects. PSPICE and LabView are used; written and oral reports are required. Laboratory fee; 2 credit hours.

EE 355 Control Systems
Prerequisite: EE 302. The modeling of linear and nonlinear physical systems with discrete and continuous state space equations. Solutions to the discrete and continuous linear state equation; state transition matrices; phase variable forms. Eigenvalues and eigenvectors; Jordan canonical form. Controllability and observability of discrete and continuous systems. Relationships between controllability, observability and transfer functions. The stability of discrete and continuous linear systems, Liapunov, root locus, Nyquist, feedback; PID control; lead-lag control. 3 credit hours.

EE 356 Digital Systems II
Prerequisites: EE 255 or equivalent. Course focuses on sequential logic design. Both synchronous and asynchronous techniques are covered with an emphasis on controller-based modular design. Design with a hardware description language. Advanced topics will be covered as time permits. Course includes laboratory activity. 3 credit hours.

EE 371 Computer Engineering
Prerequisites: CS 111, EE 255. Introduction to the architecture of digital computers. Stored program concept, instruction processing, memory organization, instruction formats, addressing modes, instruction sets, assembler and machine language programming. Input/output programming, direct memory access. Bus structures and control signals. Course includes laboratory activity. 3 credit hours.

EE 437 Industrial Power Systems Engineering
Prerequisite: EE 202. Study of the components forming a power system, three-phase systems, transmission line modeling and design, per unit quantities, modeling of power systems, one-line diagrams, symmetrical components, sequence networks and unsymmetrical fault calculations, matrices and matrix algebra. 3 credit hours.

EE 438 Electric Power Transmission
Prerequisite: EE 437. Power system modeling for fault analysis using sequence networks, bus impedance matrix formulation, rake equivalent method, fault analysis by computer methods, transmission line ABCD parameters and distributed parameter analysis, design and performance using computers, load flow analysis, Gauss-Siedel method, Newton-Raphson method, economic load sharing, stability design and analysis using computers and FORTRAN programs. 3 credit hours.

EE 439 Electric Power Distribution
Prerequisites: EE 344, EE 437. Structure of electric power distribution, distribution transformers, subtransmission lines, substations, bus schemes, primary and secondary systems, radial and loop feeder designs, voltage drop and regulation, capacitors, power factor correction and voltage regulation, protection, buses, automatic reclosures and coordination. 3 credit hours.

EE 445 Communications Systems
Prerequisite: EE 320. The analysis and design of communications systems. Signal analysis, transmission of signals, power density spectra, amplitude, frequency and pulse modulation; pulse code modulation; digital signal transmission. Performance of communications systems and signal to noise ratio. 3 credit hours.

EE 446 Digital Electronic Circuits
Prerequisite: EE 348. Analysis and design of digital circuit classes (comparators and logical gates) by application of Ebers-Moll transistor model (saturation/active/cutoff regions). Comparators treated as overdriven differential/operational amplifiers, including bistable Schmitt trigger. Gates treated for major technologies: resistor-transistor logic (RTL); transistor-transistor logic (TTL); and emitter-coupled logic (ECL). Related integrated circuit analysis including internal variables and I-O characteristics. 3 credit hours.

EE 450 Analog Filter Design
Prerequisite: EE 202. Techniques in the analysis and design of analog

filters. First order and second order. Design of Butterworth, Chebyshev, Bessel-Thomson and Cauer lowpass. Lowpass to bandpass, bandstop and highpass filter transformations, design, and sensitivity analysis. 3 credit hours.

EE 452 Digital Filter Design
Prerequisite: EE 302. Techniques in the analysis and design of digital filters. Digital filters terminology and frequency response. FIR filter design. IIR digital filter design including Butterworth, Cauer, and Chebyshev lowpass, highpass, bandpass and bandstop filters. The DFT and IDFT. FFT algorithms. 3 credit hours.

EE 455 Control System Design
Prerequisite: EE 355. State space representation of dynamical systems via LaGrange's equations and rigid body dynamics. Solution of linear time varying differential equations in state-space form. Interpretation and properties of the state transition matrix. Transformation of state variables and the canonical forms. Robustness and stability via frequency-domain analysis. Controllability and observability via the controllability and observability grammian. Shaping the dynamic response via pole placement using full- and reduced-order linear observers and state feedback. Compensator design by the separation principle. 3 credit hours.

EE 457 Design Preparation
Prerequisites: EE 349 and the appropriate prerequisites for the area. This course provides the student time and guidance in selecting a topic for the senior design course (EE 458) which follows this one. Suitable design projects may be suggested by the student, the faculty or via industrial contacts. Each student carries out a literature search in an area of interest, prepares a written proposal with a plan of action for the project, obtains approval by the faculty project adviser and makes an oral presentation of the project proposal. 2 credit hours.

EE 458 Electrical Engineering Design Laboratory
Prerequisite: EE 457. A laboratory course required of all B.S.E.E. candidates. The student selects a subarea of electrical engineering and devotes the entire semester to laboratory design activities under the supervision of a faculty member. This course provides the student with experience at a professional level with engineering projects that involve analysis, design, construction of prototypes and evaluation of results.

At the present time design laboratory activity includes:

Communications/Signal Process Laboratory. Prerequisites: EE 445 or EE 450 or EE 452, EE 457.

Control Systems Laboratory. Prerequisites: EE 355, EE 457.

Digital Design Laboratory. Prerequisites: EE 356, EE 371, EE 457. Corequisite: EE 472 or EE 475.

Fiber Optics/Microwave Laboratory. Prerequisite: EE 462 or EE 480, EE 457.

Machines/Power Systems Laboratory. Prerequisites EE 344, EE 437, EE 457.

Final report presentation and formal written final report required. 3 credit hours.

EE 461 Electromagnetic Theory
Prerequisites: M 203, PH 205. Basic electromagnetic theory including static fields of electric charges and the magnetic fields of steady electric currents. Fundamental field laws including Coulomb's Law, Gauss' Law, BiotSavart's Law and Ampere's Law. Maxwell's equations, scalar and vector potentials, Laplace's equation and boundary conditions. Magnetization, polarization. 3 credit hours.

EE 462 Electromagnetic Waves
Prerequisite: EE 461. Electromagnetic wave propagation and reflection in various structures, including coaxial, two-wire and waveguide systems. Transmission lines. Various modes of propagation in rectangular waveguides. The dipole antenna. Linear antenna arrays. 3 credit hours.

EE 472 Computer Architecture
Prerequisite: EE 356. Introduction to theory of computing, processor design, control unit design, microprogramming, memory organization, survey of parallel processors as time permits. 3 credit hours.

EE 475 Microprocessor Systems
Prerequisite: EE 371. Microprocessors and peripheral devices. Hardware and software aspects of interfacing. Microprocessor-based system design. Introduction to advanced topics such as data comu-

nications, memory management and multiprocessing, as time permits. The course is structured around laboratory exercises. 3 credit hours.

EE 480 Fiber Optic Communications
Prerequisite: EE 461. The fundamentals of lightwave technology, optical fibers, LEDs and lasers, signal degradation in optical fibers. Photodetectors, power launching and coupling, connectors and splicing techniques. Transmission link analysis. This course will include selected laboratory experiments. 3 credit hours.

EE 500 Special Topics in Electrical Engineering
Prerequisite: instructor's consent. Special topics in the field of electrical engineering. 3 credit hours.

EE 599 Independent Study
Prerequisite: consent of faculty supervisor and approval of department chair. (Refer to academic regulations for independent study.) Independent study provides the opportunity to explore an area of special interest under faculty supervision. May be repeated. 3 credit hours.

ENVIRONMENTAL SCIENCE

EN 101 Introduction to Environmental Science
Today's environmental problems have scientific, social and political aspects to them. This course, which is strongly suggested for majors and is suitable for nonmajors, will focus on the scientific aspects, but will not ignore the other two. The student will be introduced to the geology, biology, physics and chemistry behind the problems and to the social and political difficulties inherent in dealing with them. Through a combination of lectures, case histories, in-class discussions and observation of the environmental decision making process at work, it is hoped that the student will gain an understanding of the complex nature of environmental problems and of the choices that must be made in solving them. *May be taken concurrently with EN 102 Environmental Science Laboratory for laboratory science credit.* Environmental Science majors and minors must take EN 102 concurrently. 3 credit hours.

EN 102 Environmental Science Laboratory
Corequisite: EN 101. A laboratory to accompany EN 101 Introduction to Environmental Science. Laboratory and field methods of identifying, characterizing and dealing with environmental concepts and problems such as water quality, waste disposal, ecosystem structure and change, population growth, pesticides and food production. Some field work required. Portions of some laboratory sessions will be devoted to discussion. 1 credit hour.

EN 320 Introduction to Environmental Geology
Prerequisite: EN 101 and introductory chemistry or physics. An introduction to geology-related environmental problems and the applications of geology to environmental problem solving. Topics will include an introduction to basic physical geology, natural hazards–causes and remediation, energy and mineral resources, waste disposal and the applications of geology to land use planning. 3 credit hours.

EN 500 Environmental Geoscience
Prerequisite: M 115 or permission of instructor. Study of the systems of atmosphere, hydrosphere and lithosphere important in the understanding of the causes of and solutions to environmental problems. Includes material from meteorology, climatology, oceanography, geology, geophysics, geomorphology and hydrology. Some weekend field trips, or acceptable alternative, required. 3 credit hours.

EN 502 Environmental Effects of Pollutants
Prerequisites: BI 320 EN 500. The demonstrated and suspected effects of air, water and other pollutants on natural systems and on human welfare. Methods of studying effects. Some weekend field trips, or acceptable alternative, required. 3 credit hours.

EN 521 Hydrology
Prerequisite: Any one of the following: a college-level course in physics, geology, hydraulics, lim-

nology or permission of instructor. Lectures cover basic hydrologic theory including nature and chemical behavior of water, precipitation and evapotranspiration, interception, surface water, ground water, water supply and treatment, and water law. Other topics may include irrigation, flood control karst hydrology and water chemistry. Required labs cover field measurement, sampling and problem-solving techniques. Some weekend fieldwork required. Laboratory fee; 4 credit hours.

EN 525 Geomorphology
Prerequisite: EN 500/600 or a previous college-level course in physical geology or geography, or permission of instructor. Study of landforms and the processes that produce them including the operation of erosional and depositional processes in a variety of geologic settings (fluvial, coastal, glacial, periglacial, karst and arid). Also covers relationship of landforms and processes to the solution of environmental problems. Lectures cover processes and laboratories focus on landform recognition and geomorphic process interpretation using maps and aerial photographs. Two required field trips (one 2-day and one 2 1/2-day) with shared transportation and costs. 4 credit hours.

EN 527 Soil Science
Prerequisite: EN 500/600 or a previous college level course in physical geology/geography or permission of instructor. Properties, occurrence and management of soil as a natural resource. Covers the chemistry, physics, morphology and mineralogy of soils and their genesis and classification. Soil properties will be related to their role in environmental problem solving and decision making. 3 credit hours.

EN 533 Special Topics in Field Geology
Prerequisite: EN 500/600 or a previous college level course in geology; other prerequisite(s) depend on specific course topic. Selected field studies and trips of special interest. Credit varies depending on the length of the trip or investigation. May be taken more than once. 1-4 credit hours.

EN 540 Introduction to Geographical Information Systems
Survey of GIS technology, research and applications in natural resource management, environmental assessment, urban planning, business, marketing and real estate, law enforcement, public administration and emergency preparedness. Includes critical evaluation, case studies and computer demonstrations. 3 credit hours.

EN 599 Independent Study
Prerequisites: environmental science major, consent of the department. Weekly conferences with adviser. Three hours of work per week required per credit hour. Opportunity for the student, under the direction of a faculty member, to explore an area of personal interest. A written report of the work carried out is required. 1-6 credit hours, maximum of 6.

ENGINEERING SCIENCE

ES 103 Technology in Modern Society
Scientific and technological developments and their implications for the future of society. Prospects and problems in communications, energy sources, automation, transportation and other technologies. Use and control of technological resources for public benefit. 3 credit hours.

ES 107 Introduction to Engineering
Prerequisite: M109 or equivalent. Overview of the problems, perspectives and methods of the engineering profession. Modeling of real world problems for purposes of optimization, decision-making and design. Practical techniques of problem formulation and analysis. 3 credit hours.

ES 108 Engineering Workshop
Prerequisite: M 115 (may be taken concurrently). An introduction to the use of elementary statistics and basic computer modeling for engineering problem-solving. Computer packages used may include spreadsheets, databases, math packages and drafting. 1 credit hour.

ES 345 Applied Engineering Statistics

Prerequisites: M 203 and junior standing. Topics include basic terminology, data presentation, descriptive statistics, curve-surface fitting and correlation, probability and model fitting, random variables, statistical inferences, one-way analysis of variance, prediction and tolerance intervals, and control charts. 3 credit hours.

ES 415 Professional Engineering Seminar
Prerequisite: senior status. Discussion of topics on professional engineering and ethical matters pertaining to the practice of engineering. *This course intended for non-civil engineering majors. Civil engineering majors take CE 407.* 1 credit hour.

FRESHMAN EXPERIENCE

FE 001 Freshman Experience Seminar
A ten-week course required during the first semester of study for all full-time/day students. The goal of this team-taught seminar class is to give students the tools to help them understand and succeed in a competitive environment by addressing such topics as the mission of UNH, academic standards, diversity, time and stress management, college life vs. high school, university relationships, responsible human sexuality, exploration of self, alcohol and substance abuse, and career planning and development. Seminar fee; 1 credit hour.

FINANCE

FI 313 Business Finance
Prerequisites: A 101, EC 133, QA 217. An introduction to the principles of financial management and the impact of the financial markets and institutions on that managerial function. An analytic emphasis will be placed on the tools and techniques of the investment, financing and dividend decision. In addition, the institutional aspects of financial markets, including a description of financial instruments, will be developed. 3 credit hours.

FI 314 Principles of Real Estate
Prerequisite: FI 313. An introduction to the fundamentals of real estate practice and the essentials of the various aspects of the real estate business. Emphasis will be placed on brokerage, mortgage financing, investments, management and valuation relative to commercial and industrial real estate. 3 credit hours.

FI 325 International Finance
Prerequisite: FI 313. An introduction to the theory and determination of foreign exchange rates, mechanisms of adjustment to balance of payments disturbance, fixed vs. flexible exchange rates. The international reserve supply mechanism and proposals for reform of the international monetary system. 3 credit hours.

FI 327 Risk and Insurance
Prerequisite: FI 313. An examination and evaluation of risk in business affairs and the appropriate methods for handling them from the viewpoint of the business firm. Emphasis will be placed on, and extended consideration devoted to, the various forms of insurance coverage. 3 credit hours.

FI 329 Corporate Financial Management
Prerequisite: FI 313. A comprehensive analysis of the structure of optimal decisions relative to the functional areas of corporate financial decision making. Emphasis is placed on developing an understanding of the applications and limitations of decision models for the investment, financing and dividend decisions of the corporation. Topics include: firm valuation, capital budgeting, risk analysis, cost of capital, capital structure and working capital management. 3 credit hours.

FI 330 Investment Analysis and Management
Prerequisite: FI 313. An analysis of the determinants of valuation for common stocks, preferred stocks, bonds, convertible bonds and preferred stock, stock warrants, and puts and calls. Emphasis will be placed on the analytic techniques of security analysis, portfolio analysis and portfolio selection. 3 credit hours.

FI 341 Financial Decision Making
Prerequisite: FI 330. An examination of the conceptual foundations underlying portfolio theory, capital market theory and firm financial

decision making. Emphasis will be placed on an integrated analysis of firm financial decision making under varying conditions of certainty and capital market perfections. 3 credit hours.

FI 345 Financial Institutions and Markets
Prerequisite: FI 313 (may be taken concurrently). An examination of the relationship between the financial system and the level, growth and stability of economic activity. Emphasis will be placed on the theory, structure and regulation of financial markets and institutions, coupled with the role of capital market yields as the mechanism that allocates savings to economic investment. 3 credit hours.

FI 371 Structuring and Financing a New Business
Prerequisite: FI 313. This course covers the financing requirements for a new business start-up. Students will learn the process of evaluating a venture and structuring the deal for raising money to finance the business. 3 credit hours.

FI 450-454 Special Topics in Finance
Prerequisite: FI 313. Junior-level standing required unless specified in course schedule description and instructor or finance coordinator approval. In-depth coverage of a selected topic in finance. 3 credit hours.

FI 598 Internship
Prerequisite: FI 313.On-the-job learning in selected organizations in the areas related to the student's major. 3 credit hours.

FI 599 Independent Study
Prerequisite: FI 313. The student undertakes independent research in finance under supervision of an instructor. The topic and meetings will be coordinated with the instructor. Research findings are presented in a formal paper. 3 credit hours.

FRENCH

FR 101-102 Elementary French I and II
Stresses pronunciation, aural and reading comprehension, basic conversation and the fundamental principles of grammar. 3 credit hours each term.

FR 201-202 Intermediate French I and II
Prerequisites: FR 101-102 or equivalent. Stresses the reading comprehension of modern prose texts and a review of grammar necessary for this reading. Students are encouraged to do some reading in their own areas of interest. 3 credit hours each term.

FIRE SCIENCE

FS 102 Principles of Fire Science Technology
Introduction to fire science. Review of the role, history and philosophy of fire protection in the United States. Particular emphasis placed on identifying fire hazards and finding appropriate methods of protecting life and property from fire. Includes career orientation and discussion of current and future problems in fire protection. 3 credit hours.

FS 105 Municipal Fire Administration
Delineates the fire safety problem, explores accepted administrative methods for getting work done, covers financial considerations, personnel management, fire insurance rates, water supply, buildings and equipment, distribution of forces, communications, legal considerations, fire prevention, fire investigation, emergency medical services, and records and reports. Designed for individuals involved in providing fire protection and EMS services in the public or private sector as well as those in safety or insurance. 3 credit hours.

FS 106 Emergency Scene Operations
The responsibilities and operating modes of officers commanding fire department units, including engine, ladder and rescue companies. An in-depth study of the Incident Command System and its application. Initial evaluation of the problems confronting first responding units. Outline of particular problems encountered in various types of occupancies and buildings. Stress on safety of the operating forces as well as of the public. Standpipe and sprinkler

system utilization. Overhauling operations. 3 credit hours.

FS 201 Essentials of Fire Chemistry with Laboratory
Prerequisite: CH 115/117 or permission of instructor. The examination of the chemical requirements for combustion, the chemistry of fuels and explosive mixtures and the study of the various methods of stopping combustion. Analysis of the properties of materials affecting fire behavior. Detailed examination of the basic properties of fire. 4 credit hours.

FS 203 Fire and Casualty Insurance
Provides a working knowledge of the property and casualty insurance industry with an emphasis on property and liability coverages. The basic fire insurance policy is studied in depth. Methods of rating buildings to promulgate a property insurance rate. Various methods of estimating the replacement cost and actual cash value of buildings are practiced. The concept of HPR (Highly Protected Risk) is studied. 3 credit hours.

FS 204 Fire Investigation I
Prerequisite: FS 102, FS 201. An analysis of fire investigations from the viewpoint of the field investigator. An in-depth study of determining the cause and origin of fires. Proper protection and collection of evidence will be covered. 3 credit hours.

FS 207 Fundamentals of Fire Prevention
Fundamentals of fire loss; standards; fire laws; and the engineering, chemistry and physics related to fire protection and prevention. Fire inspection practices and procedures as well as the fire and safety problems involved in various occupancies will be discussed in depth. 3 credit hours.

FS 208 Instructor Methodology
A study of the methods and techniques of teaching fire safety and security to public safety and industrial employees. The use and development of visual aids. Actual teaching demonstrations and practice. 3 credit hours.

FS 301 Building Construction Codes and Standards
Prerequisite: FS 102. An in-depth study of building construction with a particular emphasis on how each type of construction reacts to conditions present during a fire. Emergency responder safety will be a key issue. Potential signs of collapse will be studied in depth. The codes involved in building construction and fire/life safety. 3 credit hours.

FS 302 Chemistry of Hazardous Materials
Prerequisite: FS 201. An in-depth study of the chemical and physical properties of a wide variety of hazardous materials to enable the student to establish the safety measures in a hazardous chemical environment. Basic properties of hazardous materials and appropriate handling methods. Explanation of chemical reactions, toxicity, oxidation, characteristics of explosives, plastics, resins and fibers. 3 credit hours.

FS 303 Process and Transportation Hazards
Prerequisite: FS 201. A strong overview of the types and properties of hazardous materials as well as their modes and methods of transportation, storage and use. Types and hazards of various containers. In-depth study of identification and control of emergencies involving hazardous materials. The various marking systems used to aid in identification. 3 credit hours.

FS 304 Fire Detection and Control
Prerequisite: FS 102. An overview of fire detection and suppression equipment as well as the associated NFPA standards. Various types of fire detectors and detection/alarm systems. Basic electric circuits and the proper application, design and installation of these systems. Non-water-based fire suppression systems. 3 credit hours.

FS 305 Fire Detection and Control Laboratory
Corequisite: FS 304. Electrical circuitry as applied to fire alarm/detection systems. Practical experience with various panels and detectors. Advantages and disadvantages of open vs. closed circuits and methods of overcoming circuit disadvantages. 1 credit hour.

FS 308 Industrial Fire Protection I
Prerequisite FS 102. A study of fire

hazards and potential fire causes in business and industry. Critical analysis of private protection measures available to reduce loss potential. Various methods of providing an acceptable level of protection for various industrial occupancies. 3 credit hours.

FS 309 Industrial Fire Protection II
Prerequisite: FS 308. An exploration of management and organizational principles with emphasis on industrial fire equipment, fire brigades, loss control programs, and OSHA regulations dealing with industry. 3 credit hours.

FS 311 Fire Protection Fluids and Systems
Prerequisite: FS 102. Study of the fluids used in fire suppression systems as well as the systems and hardware utilized to distribute the agent. Chemical and physical properties of fluids used in fire suppression systems. Fundamentals of automatic sprinkler systems. The design and testing of fire protection water supplies. The codes involved in water-based fire suppression systems. 3 credit hours.

FS 312 Fire Protection Fluids and Systems Laboratory
Corequisite: FS 311. This course supplements FS 311 Fire Protection Fluids and Systems by providing a more in-depth study of the hydraulic principles used in designing water-based fire suppression systems. The process of designing and reviewing hydraulic-designed automatic sprinkler systems, including the use of computer programs for these purposes. Hands-on testing of fire protection water supplies. 1 credit hour.

FS 313 Fire Investigation II
Prerequisite: FS 204. An advanced course geared towards personnel who have or may have statutory responsibility for fire investigation in the public sector and for private sector persons who conduct or may conduct investigations for insurance companies or litigation purposes. Proper techniques for investigation of fires and explosions will be studied in depth along with the appropriate standards. 3 credit hours.

FS 314 Fire Investigation II Laboratory
Corequisite: FS 313. Experiments and practical experience in fire investigation with an emphasis on proper investigative techniques. 1 credit hour.

FS 325 Fire/Life Safety Codes
Study of NFPA-101 Life Safety Code in depth, along with the various occupancies involved within structures. The basic concepts, interrelationships of these requirements and the need for redundancy of safeguards provided. Application of this and other applicable codes; building codes and other reference codes. 3 credit hours.

FS 404 Special Hazards Control
Prerequisite: FS 102. Types of industrial processes requiring special fire protection treatment such as heating equipment, flammable liquids, gases and dusts. Emphasis on fundamental theories involved, inspection methods, determination of relative hazard, application of codes and standards and economics of installed protection systems. 3 credit hours.

FS 405 Fireground Management
Prerequisite: FS 106. A study of the effective management of suppression forces at various fire situations. Includes consideration of pre-fire planning, problem identification and solution implementation. Case studies of actual and theoretical fire incidents, command control concepts, maximum utilization of forces available, priorities of action and logistics at large-scale operations will be covered. 3 credit hours.

FS 408 Fire Protection Law
A study of law in relation to fire protection, liability of personnel, civil service, the search of the fire scene and criminal law related to arson and arson arrests. 3 credit hours.

FS 409 Arson for Profit
Prerequisite: FS 313/314. An overview of the financial techniques needed to investigate arson-for-profit fires with emphasis on sources of information, identification and analysis of financial documents. 3 credit hours.

FS 425 Fire Protection Plan Review
Prerequisites: FS 301, FS 304/305, FS 311/312. The technical and hands-on practical experience nec-

essary to complete a review of plans and specifications for fire safety and protection of a building. The process includes site selection, construction materials, water supplies for fire protection, fire pumps, automatic sprinkler and standpipe systems, fire alarm/detection systems as well as compliance with Fire/Life Safety Codes. 3 credit hours.

FS 450 Fire Protection Heat Transfer
Prerequisite: ME 301. The essentials of fire spread and fire behavior: the combustion process, heat transfer, limits of flammability, flames and fire plumes, burning of fuels, flaming combustion, spread of flame, flash-over, and production and movement of smoke. 3 credit hours.

FS 460 Fire Hazards Analysis
Prerequisites: FS 301, FS 304/305, FS 311/312. The application of systems analysis, probability, engineering economy and risk management techniques to the fire problem. The basic principles of fire growth and spread in a building. Time lines will be established from the time of ignition to that of extinguishment. Various methods of modifying the time line. 3 credit hours.

FS 497 Research Project
Designed to allow fire science majors to research a topic of special interest to the individual student. Development of a student project and a written report in a specific area of fire science with faculty supervision. Grade awarded upon completion of the project. 3 credit hours.

FS 498 Research Project I
Designed to allow fire science majors to research a topic of special interest to the individual student. Development of a student project and a written report in a specific area of fire science with faculty supervision. Grade awarded upon completion of the project. 1 credit hour.

FS 499 Research Project II
Designed to allow fire science majors to research a topic of special interest to the individual student. Development of a student project and a written report in a specific area of fire science with faculty supervision. Grade awarded upon completion of the project. 2 credit hours.

FS 500 Special Topics
Selected topics in fire science on a variety of current problems and specialized areas not available in the regular curriculum. 3 credit hours.

FS 501 Internship
Prerequisite: consent of the director of the fire science program. The purpose of the fire science internship is to provide the student with real-life work experience. The student will be placed with an agency, the sponsor, who agrees to provide a meaningful work experience for the intern. The intern is required to spend a minimum of 128 hours with the sponsor and prepare a paper outlining the experience. 3 credit hours.

FS 502 Emergency Medical Technician
This course is designed to prepare the basic emergency medical technician in accordance with the U.S. Dept. of Transportation curriculum and Connecticut EMS guidelines. The course covers an introductory survey of emergency medical services including medical, legal/ethical aspects, role of the EMT, CPR at the American Heart Association Basic Rescuer Level, patient assessment, care of wounds and fractures, airway maintenance, medical and environmental emergencies, patient transportation, emergency childbirth and basic extrication. Students can expect to spend some time involved in practical experiences. Laboratory fee; 6 credit hours.

FS 510 Senior Seminar
This course will integrate the current and developing knowledge of the behavior of fire with the problems presented by today's building construction, building materials and building codes. This course will use the seminar format with full student participation. 3 credit hours.

FS 599 Independent Study
Prerequisite: consent of the director of the fire science program. The independent study is designed to allow the fire science major to complete a fire science course that is not being offered or the student is otherwise unable to complete in

the traditional manner. This self study opportunity will be allowed only with permission of the director of fire science after determining that the student has sufficient background in the subject to complete the material in a satisfactory manner. 3 credit hours.

GERMAN

GR 101-102 Elementary German I and II
Stresses pronunciation, aural and reading comprehension, basic conversation and the fundamental principles of grammar. 3 credit hours each term.

GR 201-202 Intermediate German I and II
Prerequisites: GR 101-102 or the equivalent. Stresses the reading comprehension of modern prose texts and a review of grammar necessary for this reading. Students are encouraged to read in their own areas of interest. 3 credit hours each term.

HOTEL AND RESTAURANT MANAGEMENT

HR 165 Introduction to Tourism and Hospitality
An introduction to the tourism and hospitality industry. All major elements of the tourism system will be examined including customer travel patterns, transportation systems, major tourism suppliers and distribution systems, and destination marketing organizations. The role of the hospitality industry will be explored in relationship to domestic and international tourism. 3 credit hours.

HR 202 Hospitality Purchasing
Introduction to the purchasing, receiving and issuing of foods and food items. The identification of guides, preparation of specifications and cost control procedures are stressed. 3 credit hours.

HR 250 Lodging Operations
Prerequisite: HR 165. Analysis and evaluation of lodging operations to include rooms division, food and beverage, marketing, engineering and maintenance, human resources, accounting and other major functional areas. 3 credit hours.

HR 260 Survey of Private Club, Resort and Gaming Operations Management
Typical organizational structures, management techniques and the special aspects of operations for private clubs, resorts and gaming operations are studied. 3 credit hours.

HR 305 Wine Appreciation
Considers the major wines and wine regions of the world, with emphasis on American, French and German wines. Wine tasting is an integral part of the course. Students must be 21 years of age. Laboratory fee; 3 credit hours.

HR 310 Private Clubs
Typical organizational structures, management techniques and the special aspects of club operations are studied. 3 credit hours.

HR 315 Bar and Beverage Management
Manager and employee roles in developing and operating profitable beverage operations are studied. T.I.P.S. certification is offered within this course. 3 credit hours.

HR 321 Hospitality Accounting
Prerequisites: A 101 and HR 165. Financial and managerial accounting principles and practices for the hospitality industry. The Uniform Systrem of Accounts of the American Hotel and Motel Association will be followed. 3 credit hours.

HR 322 Marketing for Hospitality
Prerequisite: HR 165. An analysis of essential marketing principles as currently applied in the hospitality, tourism and dietetics industries. The hospitality marketing mix will be evaluated in terms of specific applications used in all three industry segments. 3 credit hours.

HR 325 Food and Labor Cost Management
Manager and employee roles in developing and operating profitable beverage operations are studied. 3 credit hours.

HR 326 Human Resource Management for Hospitality,
Prerequisite: HR 165. Provides the knowledge required to formulate and effectively manage human resources in a hospitality, tourism and dietetics related industry. Topics covered include manpower analysis, organizational needs, job designs, recruitment process and other human resource topics. 3 credit hours.

HR 330 Hospitality Property Management
Prerequisite: HR 165. Examines the various aspects of plant and property management to include the study of engineering systems, maintenance procedures and general management perspectives. 3 credit hours.

HR 375 Hospitality Entrepreneurship
Examination of the various aspects of marketing for the hospitality entrepreneur. Different segments of the hospitality industry will be covered. 3 credit hours.

HR 400 Leadership Theory in Hospitality
Prerequisites: HR 165 and HR 326. Situational leadership, quality management models, strategic planning, quality assurance, as well as other classical leadership and management models are applied to the hospitality, food service and tourism industries. 3 credit hours.

HR 401 Leadership Applications in Hospitality
Prerequisite: HR 400. Building on the theory presented in HR 400, this course provides the opportunity to apply knowledge of leadership models, concepts and theories through case studies and research projects. A team research project/presentation is the major focus of the course. 3 credit hours.

HR 411 Hospitality and Institutional Layout and Design
Prerequisites: HR 330 or consent of instructor. Prospectus and feasibility planning for hospitality operations. Overall property design and layout of facilities and equipment are studied. 3 credit hours.

HR 412 Hospitality Law
Prerequisite: HR 165. Application of the law to aspects of the hospitality industry to include the innkeeper/guest relationship, rights of employees/ employers, liabilities and negligent acts. 3 credit hours.

HR 450 Advanced Cuisine Management and Technique
Prerequisites: DI 200, DI 342. Capstone course in food production and service. Provides students with the opportunity to practice advanced techniques within various international and domestic cuisines. Laboratory fee; 3 credit hours.

HR 491-499 Special Topics in Hospitality
Special studies on a variety of current topics and specialized areas in the field not available as part of the regular curriculum. 3 credit hours.

HR 510 Internship
Prerequisite: Completion of 600 hours of practicum and consent of the instructor. Interns are required to complete 400 hours of internship experience in any of the following: hotels, restaurants, institutional food service or private clubs/resorts. The internship will emphasize supervisory responsibilities whenever possible. This experience will be formulated by faculty, student and industry professional cooperative efforts to help ensure the student's success. The internship will be augmented by selected management readings, written and oral reports, daily journals and faculty/professional industry management appraisals and conferences. 3 credit hours.

HR 599 Independent Study
Prerequisite: permission of the department coordinator. Independent research projects or other approved phases of independent study. 3 credit hours.

HISTORY

HS 101 Foundations of the Western World
Traces the course of western civilization from its earliest beginnings in the ancient Middle East down to the eighteenth century. Includes major cultural trends, interactions between society and economy, and analysis of the rise and fall of empires. 3 credit hours.

HS 102 The Western World in Modern Times
Europe and its global impact from the eighteenth century to the present. Includes revolutionary movements, the evolution of mass democracy and the world wars of the twentieth century. 3 credit hours.

HS 108 History of Science
The development of science and technology from antiquity to the present. Their impact on society and the world. 3 credit hours.

HS 110 American History Since 1607
A one-semester survey course, covering such major topics as colonial legacies, the American Revolution, nation-state building, sectional tensions, urbanization, industrialization, the rise of world power status, social and cultural developments and post-World War II. Not open to those who have had HS 211 or 212. 3 credit hours.

HS 120 History of Blacks in the United States
The history and background of black people in the United States. Social, political and cultural development. 3 credit hours.

HS 207 World History Since 1945
Survey of major events and trends since World War II. Advanced industrial societies are emphasized. Includes decolonization, East-West conflicts, and patterns of economic cooperation and competition. 3 credit hours.

HS 211 United States to 1865
Survey of American social economic, political and diplomatic developments from colonial times to 1865. Not open to those who have had HS 110. 3 credit hours.

HS 212 United States Since 1865
Survey of American history from 1865 to the present. Institutional and industrial expansion, periods of reform and adjustment. The U.S. as a world power. Not open to those who have had HS 110. 3 credit hours.

HS 260 Modern Asia
The ideological, cultural and traditional political, economic and diplomatic history of east, south and southeast Asia from the sixteenth century to the present. 3 credit hours.

HS 262 Modern Chinese History
A study of China from 1800, including the impact of the West and Japan; its transformation from monarchy to civil war to the People's Republic of China up to the present; the Republic of China on Taiwan; the incorporation of Hong Kong in the PRC. 3 credit hours.

HS 264 Modern Japanese History
An analysis of the diverse political, economic, social, military and cultural factors which influenced the emergence of Japan as a modern nation in the 19th and 20th centuries; its post-World War II growth into an economic giant and its current evolution. 3 credit hours.

HS 270 Europe from Renaissance Through Enlightenment
Europe from 1300 to 1800; from feudal states to nation states; development of cultural, political, social and economic life; religious unity and religious diversity. 3 credit hours.

HS 306 Modern Technology and Western Culture
The development of the modern technological world and its relationship to social, economic and cultural changes from the Industrial Revolution to the present. 3 credit hours.

HS 312 United States in the Twentieth Century
The interaction of political, economic, social, intellectual and diplomatic events and their impact on twentieth century America. 3 credit hours.

HS 345 Europe in the Nineteenth Century
European history from the Napoleonic period to World War I; its internal development and world impact. 3 credit hours.

HS 351 Russia and the Soviet Union
The development of czarist Russia from 1200 to the Revolution of 1917; the former USSR from 1917 to the present. 3 credit hours.

HS 353 Modern Britain
The development of British history

from the Restoration of 1660 to the present. Includes Britain's role in international affairs. Special emphasis on social and economic topics. 3 credit hours.

HS 355 Modern Germany
German civilization from the seventeenth century to the present; its impact on Europe and the world. 3 credit hours.

HS 381-389 Selected Studies in History
Special topics in history dealing with the modern world. An in-depth study of vital historical issues. 3 credit hours.

HS 446 Europe in the Twentieth Century
Recent and contemporary European history beginning with World War I. Institutional development and its changing role in politics. 3 credit hours.

HS 491 Senior Seminar
The undertaking of an independent study and research project. Required of all history majors in their senior year. 3 credit hours.

HS 599 Independent Study
Prerequisite: consent of faculty member and department chair. Opportunity for the student, under the direction of a faculty member, to explore an area of interest. This course must be initiated by the student. 1-3 credit hours per semester with a maximum of 6.

HUMANITIES

HU 300 The Nature of Science
Prerequisites: E 110, HS 102, a laboratory science course, and a social science course. Investigates science as a human activity, as a social institution, and as an instrument for acquiring and using knowledge. The nature of scientific knowledge, the organization of scientific activity and the interaction of science with technology and culture. A course about science and the process of generating new knowledge. 3 credit hours.

INTERNATIONAL BUSINESS

IB 413 International Marketing
Prerequisites: EC 200, MK 300. Applied marketing decision making in international firms. The development of marketing strategy and techniques in foreign markets. Study of key multinational marketing skills, especially research, product policy, pricing, promotion and distribution. 3 credit hours.

IB 421 Operation of the Multinational Corporation
Prerequisites: EC 200, FI 313, MG 310. Specific problems encountered by multinational firms. Topics include investment decisions, environmental scanning, planning and control and the social responsibilities of firms in host nations. 3 credit hours.

IB 422 International Business Negotiations
Prerequisites: EC 200, MG 310. An analysis of the various stages involved in the international business negotiating process beginning with planning and ending with post-contract adjustments. A survey and evaluation of the various primary and secondary sources negotiators can go to for information needed in the negotiating process. 3 credit hours.

IB 450 Special Topics
Prerequisite: EC 200. Junior-level standing required unless specified in course schedule description. Selected topics of special or current interest in the study of international business. 3 credit hours.

IB 549 Global Business Strategy
Prerequisite: IB 413. Identification and relation of the elements involved in the dynamics of a company and its international environment through case analysis. This is a capstone course in international business. 3 credit hours.

IB 598 Internship
Prerequisite: EC 200. Supervised field experience for qualified students in areas related to their major. 3 credit hours.

IB 599 Independent Study
Prerequisite: EC 200. A planned program of individual study under the supervision of a member of the faculty. 3 credit hours.

INDUSTRIAL

ENGINEERING

IE 204 Engineering Economics
Prerequisite: M 117. A quantitative analysis of applied economics in engineering design; the economy study for comparing alternatives; interest formulae; quantitative methods of comparing alternatives; intangible considerations; selection and replacement economy for machines and structures; break-even and minimum cost points; depreciation; effect of income taxes on the economy study; review of current industrial practices. Promotes logical decisions through the consideration of alternative courses of action. 3 credit hours.

IE 243 Work Design
Prerequisite: sophomore status. Introductory course in the design and evaluation of efficient work methods and working environments. Techniques useful in problem definition, design of alternative work methods, and evaluation of alternative designs including process charting, operation analysis and principles of motion economy. Emphasis placed on human factors and safety implications of alternative work method designs. Equitable time standards are developed for work method designs through the use of time study procedures including stopwatch time study, computerized predetermined-time systems and work sampling. 3 credit hours.

IE 302 Ergonomics
Prerequisite: junior standing. Covers basic terminology and application of ergonomic principles to the workplace. Topics include repetitive motion injuries, cumulative trauma disorders, carpal tunnel syndrome, anthropometry, human error analysis, channel capacity, reaction time, human-machine interaction, and current ergonomics news and applications. 3 credit hours.

IE 303 Cost Control
Prerequisites: junior status and M 118. Basic analysis of cost control techniques. Designed to give members of the management team the underlying rudiments of cost estimating and control systems. Theory of standard costs, flexible budgeting and overhead handling techniques emphasized by analytical problem solution. Life-cycle costing. Value engineering. 3 credit hours.

IE 304 Production Control
Prerequisites: junior status and IE 243, M 118. The basic principles that govern the design of production control systems in an industrial plant. The principles used in solving problems of procuring and controlling materials, in planning, routing, scheduling and dispatching are considered. Familiarizes the student with existing and new methods used in this field including MRP, JIT, computer-aided process planning and group technology. 3 credit hours.

IE 311 Quality Assurance
Prerequisite: junior status. Quality considerations in product design and manufacturing; product inspection and process control; total quality management principles as applied to process design, control and improvement; product safety and liability issues. 3 credit hours.

IE 344 Human Factors Engineering
Prerequisite: IE 347. Covers psychological and physiological aspects of people at work, including: work physiology, information processing, motor skills and movement control, signal detection theory and anthropometry with the aim of improvements in workplace design. 3 credit hours.

IE 346 Probability Analysis
Prerequisite: M 203. Develops the theory of probability and related applications. Covers combinations and permutations, probability space, law of large numbers, random variables, conditional probability. Bayes' Theorem, Markov chains and stochastic processes. 3 credit hours.

IE 347 Statistical Analysis
Prerequisite: IE 346. Provides an introduction to the application of statistical techniques to engineering problems. Measures of central tendency and dispersion, estimation, hypothesis testing, correlation and regression, elementary analysis of variance. 3 credit hours.

IE 348 Manufacturing Processes
Corequisite: IE 304. Provides a basic understanding of metal cut-

ting as applied to conventional manufacturing. Properties of material; machining fundamentals; tool geometry; surface finish; forces; material removal processes; casting processes; measurement and inspection; process capability and quality control; ferrous and nonferrous metals; chip/type machining processes; machining economics in turning, milling and drilling. Students are required to design and produce laboratory projects. 3 credit hours.

IE 402 Operations Research
Prerequisite: IE 346. The operations research area is oriented to various mathematical methods for solving certain kinds of industrial problems. Topics included are: linear programming, including simplex method; transportation and assignment problems; queuing; dynamic programming; simulation. 3 credit hours.

IE 403 Operations Research II
Prerequisite: IE 402 or equivalent. Advanced coverage of Bayesian statistics, utility and game theory, logistics and distribution, theory of scheduling, graph theory, and stochastic processes, with applications in manufacturing and service industries. 3 credit hours.

IE 407 Reliability and Maintainability
Prerequisite: IE 346 or equivalent. Reliability measures: hazard models and product life, reliability function; static reliability models; inference theory and reliability computation; dynamic reliability models, reliability design examples. 3 credit hours.

IE 408 Systems Analysis
Prerequisites: senior status and IE 347. Presents the analytical and conceptual techniques upon which systems analysis and development is based, as applications to business and industrial fields. Development of case studies and their application, oriented to improved designs. 3 credit hours.

IE 414 Engineering Management
Prerequisite: senior status. Provides insight into the elements of the managerial process and develops a rational approach to the problems of managing productive processes and the engineering function. Focusing largely on complex problems of top and middle-level management, students will investigate the modern tools managers use under given circumstances, stressing the ongoing activities of management as part of an integrated, continuous process. 3 credit hours.

IE 435 Simulation and Applications
Prerequisites: IE 346 and CS 111. Corequisite: IE 402. Techniques for mathematical modeling of a system (business or scientific/engineering) using computer simulation. Simulation principles will be emphasized. Student exercises and design projects will be run using modern simulation packages. 3 credit hours.

IE 436 Quality Control
Prerequisite: IE 347. Economics of quality control; modern methods used by industry to achieve quality of product; preventing defects; organizing for quality; locating chronic sources of trouble; coordinating specifications, manufacturing and inspection; measuring process capability; using inspection data to regulate manufacturing processes; statistical methods, control charts, selection of modern sampling plans. 3 credit hours.

IE 437 Metrology and Inspection in Manufacturing
Prerequisite: IE 436. The study of metrology and inspection practices in manufacturing. Emphasis on the design and development of different types of gauging for inspection in manufacturing. 3 credit hours.

IE 440 Synchronous Manufacturing
Prerequisite: IE 204 and IE 304. Group technology in design and manufacturing; manufacturing environment, resources, products, constraints and decisions; synchronized manufacturing operations and process improvement. 3 credit hours.

IE 443 Facilities Planning
Prerequisites: senior IE status and IE 243, IE 304. Factors in plant location, design and layout of equipment. Techniques for obtaining information essential to the development and evaluation of alternative facility layout designs are presented with an emphasis on environmental and safety considerations. Design of departmental areas, resource allocation and flow, materials handling, storage and the

economic implications of alternative designs are discussed. Students work in small groups on the design of a manufacturing facility to produce an actual consumer product. Project culminates in both a written and oral presentation of the proposed facility design. CAD techniques are used extensively in the development of the final facility layout. 3 credit hours.

IE 448 Advanced Manufacturing Engineering Operations
Prerequisites: ME 200 and IE 348.

A course for understanding machining economics and the basic principles of the theory of metal cutting and metal working to improve manufacturing engineering operations. Course emphasizes design and operation of better tooling for different types of manufacturing operations. Experimental investigation of metal cutting and metal working methodologies stressed. 3 credit hours.

IE 450 Special Topics in Industrial Engineering
Prerequisite: consent of instructor. Selected topics of current interest in the field of industrial engineering. 3 credit hours.

IE 460 Computer-Aided Manufacturing
Prerequisites: IE 348 and CS 110 or equivalent. Topics covered include: Computer-Aided Manufacturing (CAM), Numerical Control (NC), industrial robot applications, Flexible Manufacturing Systems (FMS), Group Technology (GT), integration of CAD/ CAM, Computer Aided Process Planning (CAPP) and applications software for manufacturing. 3 credit hours.

IE 465 Robotics in Manufacturing
Prerequisite: IE 460. Topics covered include: applications of robotics in manufacturing, robot classification, introduction to a high-level robot language, task planning, and laboratory projects with industrial robots. 3 credit hours.

IE 498 Internship
Prerequisites: consent of faculty supervisor and approval of department chair. Supervised projectwork related to industrial engineering with local industries. 3 credit hours.

IE 504 Senior Project
Prerequisites: senior status and permission of department. The student, in conjunction with a faculty adviser, selects and works on a project. Work is presented at a seminar at the end of the semester. 3 credit hours.

IE 599 Independent Study
Prerequisite: junior status. A planned program of individual study under the supervision of a member of the faculty. 3 credit hours.

JOURNALISM

J 101 Journalism I
A survey of journalism designed to acquaint students with the profession. The American newspaper as a social institution and a medium of communication. 3 credit hours.

J 201 News Writing and Reporting
Prerequisite: J 101 or permission of instructor. The elements of news, the style and the structure of news stories, news-gathering methods, copyreading and editing, reporting. 3 credit hours.

J 202 Advanced News Writing and Reporting
Prerequisite: J 201. Intensive practice in news writing and reporting. 3 credit hours.

J 311 Copy Desk
Intensive practice in copyreading, editing and revising, headline writing, photograph selection, page make-up and reporting. Regular critiques of the copy-desk work of major newspapers. 3 credit hours.

J 351 Journalistic Performance
Students follow the coverage in the media given to selected topics, and prepare to make judgments of the coverage by doing research and becoming knowledgeable about the particular topic chosen. The course stresses analytic reading and responsible, informed criticism. 3 credit hours.

J 367 Interpretive and Editorial Writing
Practice in the writing of considered and knowledgeable commentaries on current affairs and in writing of interpretive articles based on

investigation, research and interviews. 3 credit hours.

J 450-454 Special Topics in Journalism
Selected topics in journalism which are of current or special interest. 3 credit hours.

J 599 Independent Study
Prerequisite: consent of instructor and department chair. Opportunity for a student, under the direction of a faculty member, to explore an area of interest. 3 credit hours.

BUSINESS LAW

LA 101 Business Law and the Regulatory Environment
An overview of the legal system as it relates to the operation of a business. Topics will include those relating to the establishment and continuity of business relationships including contracts, sales, partnerships, corporations, agency law and business ethics, and those regulating business activities including consumer protection, environmental, employment and antitrust laws. *This course is not to be taken by students majoring in accounting or finance; accounting and finance majors take LA 111.* 3 credit hours.

LA 111 Accounting Business Law I
Law of contracts, negotiable instruments, sales, insurance. Particular attention will be devoted to applicable provisions of the Uniform Commercial Code. 3 credit hours.

LA 112 Accounting Business Law II
Prerequisite: LA 111. Law of agency, employer/employee, partnerships, corporations, security and governmental regulation; real and person property law; creditors rights and bankruptcy; wills and trust. 3 credit hours.

LA 450-454 Special Topics
Prerequisites: LA 101 or LA 111, and junior standing. Selected topics in business law of special or current interest. 3 credit hours.

LA 599 Independent Study
Prerequisites: LA 101 or LA 111, and junior standing. A planned program of individual study under the supervision of a member of the faculty. 3 credit hours.

LOGISTICS

LG 300 Defense Sector Logistics
Prerequisites: E 105, E 110, M 228, CS 107. Introduction to logistics as practiced in the defense industry, the military, and in multinational corporations operating foreign installations. Overview of logistics, elements, nomenclature, techniques, management, and computer support. Survey of regulations, standards and logistics products. Identification of logistics and its place in defense-related systems. 3 credit hours.

LG 310 Introduction to Logistics Support Analysis
Prerequisite: LG 300. Definition and description of logistics support analysis with reference to MIL-STD-1388-1A and derivative requirements. Survey of integrated logistics support theory and practice and the role of LSA. The role of a logistics support analysis plan, its method of construction, and its use in real systems. 3 credit hours.

LG 320 Reliability and Maintainability Fundamentals
Prerequisite: LG 300. Basic description and analysis of the concepts of reliability and maintainability in large high-technology systems. Introduction to quantitative techniques and quality assurance. Strategies for optimizing effectiveness and in-service support. 3 credit hours.

LG 410 Life Cycle Concepts
Prerequisites: LG 300 and LG 320.
Introduction to life cycle concepts in product design, quality engineering, field support, maintenance, training and end-use disposal. Techniques of life cycle costing and the construction of life cycle forecasts. Product and system warranties, and their interface with logistics support. 3 credit hours.

LG 440 Data Management in Logistics Systems
Prerequisites: LG 300 and LG 310. Review of the role of data collection, analysis and report generation in logistics systems management. Uses of computer-aided management information systems, technical data

acquisition, and software support in logistics organization. Requirements for documentation, data renewal and the generation of integrated logistics support plans and reports. 3 credit hours.

LG 490 Logistics Seminar
Prerequisites: LG 300, LG 310, LG 320, LG 410, LG 440. Upon completion of the prerequisite courses, students pursuing the certificate in logistics will be required to take this capstone seminar. Each student will develop an experiential case study in conjunction with a faculty adviser. This case study will draw on material learned in prerequisite courses and the student's work experience. Each student will be required to present the case study for critique by colleagues and industrial engineering faculty. 1 credit hour.

MATHEMATICS

All prerequisites for the following mathematics courses must be strictly observed unless waived with permission of the mathematics department.

M 103 Fundamental Mathematics
Required at the inception of the program of study of all students (day and evening) who do not show sufficient competency with fundamental arithmetic and algebra, as determined by placement examination. Arithmetic operations, algebraic expressions, linear equations in one variable, exponents and polynomials, Cartesian coordinates, equation of a straight line and simultaneous linear equations. (Students placed in M 103 must successfully complete this course before taking any other course having mathematical content.) Students who take M 103 will have the total number of credits required for graduation increased by 3 credits. 3 credit hours (4 to 6 meeting hours per week).

M 109 Intermediate Algebra
Prerequisite: a grade of C or higher in M 103 or placement by the department. A review of the fundamental operations and an extensive study of functions, exponents, radicals, linear and quadratic equations. Additional topics include ratio, proportion, variation, progression and the binomial theorem. 3 credit hours.

M 115 Pre-Calculus
Prerequisite: a grade of C or higher in M 109 or placement by the department. Offers the foundation needed for the study of calculus. Polynomials, algebraic functions, elementary point geometry, plane analytic trigonometry and properties of exponential functions. 4 credit hours.

M 117 Calculus I
Prerequisite: a grade of C or higher in M 115 or placement by the department. The first-year college course for majors in mathematics, science and engineering; and the basic prerequisite for all advanced mathematics. Introduces differential and integral calculus of functions of one variable, along with plane analytic geometry. 4 credit hours.

M 118 Calculus II
Prerequisite: a grade of C or higher in M 117. Continuation of first-year calculus, including methods of integration, the fundamental theorem of calculus, differentiation and integration of transcendental functions, varied applications, infinite series and indeterminate forms. 4 credit hours.

M 121 Algebraic Structures
A first course in an orientation to abstract mathematics: elementary logic, sets, mappings, relations, operations, elementary group theory. Open to all freshmen and sophomores. 3 credit hours.

M 127 Finite Mathematics
Prerequisite: M 103 or placement by the department. Functions and lines, linear systems, linear programming, mathematics of finance, sets and counting, and an introduction to probability. Numerous applications and an introduction to computing and computers. 3 credit hours.

M 203 Calculus III
Prerequisite: a grade of C or higher in M 118. The calculus of multiple variables, covering three-dimensional topics in analysis, linear algebra, and vector analysis, partial differentiation, maxima and minima for functions of several variables, line integrals, multiple integrals, spherical and cylindrical polar coordinates. 4 credit hours.

M 204 Differential Equations
Prerequisite: M 203. The solution of ordinary differential equations, including the use of Laplace transforms. Existence of solutions, series solutions, matrix methods, nonlinear equations and varied applications. 3 credit hours.

M 228 Elementary Statistics
Prerequisite: M 127. A noncalculus based course which includes basic probability theory, random variables and their distributions, estimation and hypothesis testing, regression and correlation. Emphasis on an applied approach to statistical theory with applications chosen from many different fields of study. Students will be introduced to and make use of the computer package SPSS for data analysis. *Not open to students who have taken calculus.* 4 credit hours. (This course is cross listed with P 301 Statistics for the Behavioral Sciences.)

M 301 Geometry from a Modern Viewpoint
Prerequisite: M 117. A modern approach to Euclidean geometry with emphasis on proofs; basic results on lines, planes, angles, polygons, circles, spheres; coordinate and vector viewpoints. 3 credit hours.

M 303 Advanced Calculus
Prerequisite: M 204. A survey course in applied mathematics. Vector calculus: line and surface integrals, integral theorems of Green and Stokes, and the divergence theorem. Complex variables: elementary functions, Cauchy-Riemann equations, integration, Cauchy integral theorem, infinite series, calculus of residues and conformal mapping. 3 credit hours.

M 305 Discrete Structures
Prerequisite: M 118; corequisite: M 203. Methods of proof, the integers, induction, prime numbers, recursive algorithms, greatest common divisors, the Euclidean algorithm, the fundamental theorem of arithmetic, congruences. 3 credit hours.

M 308 Introduction to Real Analysis
Prerequisite: M 204. Sets and functions, the real numbers, topology of the line, limits, continuity, completeness, compactness, connectedness, sequences and series, the derivarive, the Riemann integral, the fundamental theorem of calculus, sequences and series of functions. 3 credit hours.

M 309 Advanced Differential Equations
Prerequisite: M 204. Theorerical analysis and applications of nonlinear differential equations. Phase plane and space, perturbation theory and techniques, series and related methods, stability theory and techniques and relaxation phenomena. 3 credit hours.

M 311 Linear Algebra
Prerequisite: M 203. Matrices, systems of linear equations and their solutions, linear vector spaces, linear transformarions, eigenvalues and eigenvectors. Applications. 3 credit hours.

M 321 Modern Algebra
Prerequisites: M 305 or M 311. Groups, rings, integral domains, fields, polynomials. 3 credit hours.

M 325 Number Theory
Prerequisite: M 305. Topics are selected from the following: mathemarical induction, Euclidean algorithm, integers, number theoretic functions, Euler-Fermat theorems, congruences, quadratic residues and Peano axioms. 3 credit hours.

M 331 Combinatorics
Prerequisite: M 311 or permission of the department. Problem solving using graph theory and combinatorical methods. Topics include counting methods, recurrence, generating functions, enumeration, graphs, trees, coloring problems, network flows and matchings. Special emphasis on reasoning which underlies combinatorical problem solving, algorithm development and logical structure of programs. 3 credit hours.

M 338 Numerical Analysis
Prerequisites: M 203 and a standard programming language. Topics include: solutions of algebraic and transcendental equations by iterative methods; system of linear equations (matrix inversion, etc.); interpolation, numerical differentiation and integration; solution of ordinary differential equations. Scientific and engineering applications. 3 credit

hours. (This course is cross listed with EE 341 Numerical Methods in Engineering.)

M 361 Mathematical Modeling
Prerequisites: at least junior status and M 311. Problem solving through mathematical model building. Emphasis on applications of mathematics to the social, life and managerial sciences. Topics are selected from probability, graph theory, Markov processes, linear programming, optimization, game theory, simulation. 3 credit hours.

M 371 Probability and Statistics I
Prerequisite: M 203. Axiomatic study of probability: sample spaces, combinatorical analysis, independence and dependence, random variables, distribution functions, moment generating functions, central limit theorem. 3 credit hours.

M 381 Real Analysis
Prerequisite: M 308. Foundation of analysis, sets and functions, real and complex number systems; limits, convergence and continuity, sequences and infinite series, differentiation. 3 credit hours.

M 403 Techniques in Applied Mathematics
Prerequisite: M 204. Techniques in applied analysis including Fourier series; orthogonal functions such as Bessel functions, Legendre polynomials, Chebychev polynomials, Laplace and Fourier transforms; product solutions of partial differential equations and boundary value problems. 3 credit hours.

M 423 Complex Variables
Prerequisite: M 204. For mathematics, science and engineering students. Review of elementary functions and Euler forms; holomorphic functions, Laurent series, singularities, calculus of residues, contour integration, maximum modulus theorem, bilinear and inverse transformation, conformal mapping, and analytic continuation. 3 credit hours.

M 441 Topology
Prerequisite: M 381 or permission of department chair. Topics selected from the following: Hausdorff neighborhood relations: derived, open and closed sets; closure; topological space; bases; homeomorphisms; relative topology; product spaces; separation axioms; metric spaces; connectedness and compactness. 3 credit hours.

M 450-453 Special Topics in Mathematics
Selected topics in mathematics of special or current interest. 3 credit hours.

M 472 Probability and Statistics II
Prerequisite: M 371. Elements of the theory of point estimation, maximum likelihood estimates, theory of testing hypotheses, power of a test, confidence intervals, linear regression, experimental design and analysis of variance, correlation, and nonparametric tests. 3 credit hours.

M 473 Advanced Statistical Inference
Prerequisite: M 472. This course is designed to provide an in-depth treatment of statistical inference. Topics include distribution of functions of one or several random variables, N-P structure of tests of hypothesis, properties of "good" estimators and the multivariate normal distribution. 3 credit hours.

M 481 Linear Models I
Prerequisite: M 472. This course is designed to provide a comprehensive study of linear regression. Topics include simple linear regression, inference in simple linear regression, violations of model assumptions, multiple linear regression and the Extra Sum of Squares Principle. 3 credit hours.

M 482 Linear Models II
Prerequisite: M 481. Continuation of M 481, with an emphasis on experimental design. Topics include single-factor designs, two-factor designs, multiple-factor designs and randomized block designs. 3 credit hours.

M 491-499 Department Seminar
A study of a mathematical topic or topics not covered in the above courses. Subject of study will be announced by the mathematics department in advance. A paper and/or seminar talk, suitable for presentation to all interested mathematics faculty, will be required. 3 credit hours.

M 599 Independent Study

Prerequisite: consent of faculty member and department chair. Opportunity for the student, under the direction of a faculty member, to explore an area of interest. This course must be initiated by the student. 1-3 credit hours.

MECHANICAL ENGINEERING

Design elective/required choices are indicated by (D) following course title.

ME 101 Engineering Graphics
Fundamentals of orthographic projections, pictorial views, auxiliary views, sectional views, descriptive geometry, dimensioning and tolerancing. Working drawings and blueprint reading. Introduction to computer-aided drafting in two and three dimensions using contemporary CAD software. 2 credit hours.

ME 200 Engineering Materials
Prerequisite: CH 103. A study of the properties of the principal engineering materials of modern technology: steels and nonferrous alloys and their heat treatment, concrete, wood, ceramics and plastics. Gives engineers sufficient background to aid them in selecting materials and setting specifications. 3 credit hours.

ME 204 Dynamics
Prerequisites: M 118 , PH 150. Free-body diagrams, equilibrium of forces, friction. Kinematics and dynamics of particles and rigid bodies with emphasis on two-dimensional problems. Vector representation of motion in rectangular, polar and natural coordinates. Impulse-momentum and work-energy theorems. Rigid bodies in translation, rotation and general plane motion. 3 credit hours.

ME 215 Instrumentation Laboratory
Prerequisites: CE 205, E 225 (may be taken concurrently), M.E. Skills Workshop. Laboratory experiments introducing equipment and techniques used to measure force, static displacement, dynamic motion, stress, strain, fluid flow, pressure, and temperature. Introduction to data acquisition, data analysis and control using microcomputers. 2 credit hours.

ME 222 Methods of Mechanical Design (D)
Prerequisites: CE 205, ME 101. Introduction to the mechanical design process including planning, phases of design, methods and documentation. Understanding the design problem, planning a project, concept generation and evaluation, design matrix and Pugh's method. Product design and generation, manufacturing processes, cost estimation, concurrent design. Product evaluation. Implementation of methods via hardware design project. 3 credit hours.

ME 301 Thermodynamics I
Prerequisites: M 118, PH 150. Classical thermodynamics treatment of first and second laws. Thermal and caloric equations of state. Closed and open systems, and steady flow processes. Absolute temperature, entropy, combined first and second laws. Power and refrigeration cycles. 3 credit hours.

ME 302 Thermodynamics II
Prerequisites: CS 110, M 203 (may be taken concurrently), ME 301. Extensions and applications of first and second laws; availability, combustion process, ideal gas mixtures. Maxwell's relations. HVAC topics. Advanced thermodynamic cycles. 3 credit hours.

ME 304 Mechanical Behavior of Materials
Prerequisite: ME 200. Detailed study of elastic and plastic deformation of materials at room temperature and elevated temperatures. Dislocation theory and microplasticity models considered. 3 credit hours.

ME 307 Solid Mechanics
Prerequisites: CE 205 and M 203. Elastic behavior of structural elements such as beams, columns and shafts. Stress and strain at a point. Plane stress and plane strain. Stress and strain transformations, Mohr's circle. Theories of yielding and failure. Introduction to the finite element method of stress analysis and computer-aided engineering. 3 credit hours.

ME 315 Mechanics Laboratory
Prerequisites: CE 205, ME 204, ME 215. Laboratory experiments

in mechanics of materials, vibrational analysis, computer-aided data acquisition and analysis. Emphasis placed on measurement techniques, report writing, and error analysis. 2 credit hours.

ME 321 Incompressible Fluid Flow
Prerequisites: M 204, ME 204. Fluid kinematics, continuity equation, vector operations. Momentum equation for frictionless flow, Bernoulli equation with applications. Irrotational flow, velocity potential, Laplace's equation, dynamic pressure and lift. Stream function for incompressible flows. Rotational flows, vorticity, circulation, lift and drag. Integral momentum analysis. Navier-Stokes equation, stress tensor. Newtonian fluid. Boundary layer approximations. 3 credit hours.

ME 330 Fundamentals of Mechanical Design (D)
Prerequisite: CE 205 (may be taken concurrently). Review of methods of mechanical design. Development of fundamental engineering analysis involving static and fatigue failure. Topics include the maximum shear and Von Mises theories of static design, safety factor, Soderberg and Goodman diagrams for fatigue design, modified endurance limit, reliability analysis, statistical considerations and stress concentration. Introduction to codes and standards. Practical applications. 3 credit hours.

ME 343 Mechanisms (D)
Prerequisite: ME 204. Graphic and analytic methods for determining displacements, velocities and accelerations of machine components. Applications to simple mechanisms such as linkages, cams, gears. Design project. 3 credit hours.

ME 344 Mechanics of Vibration
Prerequisites: M 204, ME 204. The mathematical relationships necessary for the solution of problems involving the vibration of lumped and continuous systems. Damping, free and forced motions, resonance, isolation, energy methods, balancing. Single, two and multiple degrees of freedom. Vibration measurement. 3 credit hours.

ME 355 Interfacing and Control of Mechanical Devices (D)
Prerequisites: CS 110, EE 212 or consent of instructor. A practical, hands-on approach to connecting, monitoring and control of thermo sensors, motors, encoders and other sensors and transducers using a PC and a multipurpose expansion board. Topics include hardware connections, voltage input and output, motor-generator and motor-encoder feedback, stepper motors, thermal control and digital switching. 3 credit hours.

ME 404 Heat and Mass Transfer
Prerequisites: M 204, ME 302, ME 321 (may be taken concurrently). Conduction in solids, solution of multidimensional conduction problems, unsteady conduction, radiation, boundary layer and convection. Introduction to mass transfer. Lectures include occasional demonstrations of convection, radiation, heat exchangers. 3 credit hours.

ME 407 Solar Energy Thermal Processes (D)
Prerequisite: ME 404 (may be taken concurrently). Introduction to the fundamentals of solar energy thermal processes including solar radiation, flat plate and focusing collectors, energy storage, hot water heating, cooling and auxiliary system components. Emphasis on the design and evaluation of systems as they pertain to commercial and residential buildings. 3 credit hours.

ME 408 Advanced Mechanics
Prerequisites: M 204, ME 204. Plane and spatial motion of particles and rigid bodies, inertia tensor, relative motion, gyroscopes, central force motion. Lagrangian and Hamiltonian methods. 3 credit hours.

ME 411 Fundamentals of Thermo/Fluid Design (D)
Corequisites: ME 302, ME 330. Introduction to the design of specific thermal, heat and fluid devices and systems as they apply to practical design problems. Review of design methodology and basic equations in thermal sciences. Group design studies in each of the three basic areas of heat exchangers, prime movers and piping systems. 3 credit hours.

ME 415 Thermo/Fluids Laboratory
Prerequisites ME 215, ME 321,

ME 404 (may be taken concurrently). A survey of experiments and laboratory investigations covering the areas of fluid mechanics, thermodynamics, hear transfer and gas dynamics. 2 credit hours.

ME 422 Compressible Fluid Flow
Prerequisites: ME 302, ME 321, ME 404. Compressible fluid flow with emphasis on one-dimensional ducted steady flows with heat transfer, frictional effects, shock waves and combined effects. Introductory considerations of two- and three-dimensional flows. Applications to propulsive devices. Occasional demonstrations accompany the lectures. 3 credit hours.

ME 426 Turbomachinery
Prerequisites: ME 302, ME 321. Review of basic thermodynamics and fluid mechanics. Dimensional analysis. Specific speed. Classification of turbomachines. Cavitation. Losses. Definitions of efficiency. Theories of turbomachines. Design considerations for stator blades and rotor blades. Computer-aided design. 3 credit hours.

ME 427 Computer-Aided Engineering (D)
Prerequisites: ME 307, and ME 344 or ME 404 (may be taken concurrently). Integration of computers into the design cycle. Interactive computer modeling and analysis. Geometrical modeling with wire frame, surface, and solid models. Finite element modeling and analysis. Problems solved involving structural, dynamic, and thermal characteristics of mechanical devices. 3 credit hours.

ME 431 Mechanical Engineering Design I (D)
Prerequisites: ME 330 and senior status or instructor's consent. Basic aspects of power transmission. Topics include: friction train, belt and chain drives, gear drive, planetary and differential trains. Study of air and hydraulic components and analysis of machine elements including shafts, springs, clutches, bearings, gears. In-house and industrial projects in solids and thermal/fluids areas. Student groups determine problem requirements and objectives and decide on the best design alternatives. Oral project presentations. Course available only in fall semester. 3 credit hours.

ME 432 Mechanical Engineering Design II (D)
Prerequisite: ME 431. Projects initiated in ME 431 are carried to completion by the same groups. Detailed design drawings and prototype construction, testing and evaluation. Midterm and final oral presentations and comprehensive written reports. Course available only in spring semester. 3 credit hours.

ME 435 Advanced Mechanical Design (D)
Prerequisites: ME 321, ME 431. Selected advanced topics related to the design of machine elements such as hydrodynamic theory of lubrication and principles of hydraulic machines with application to hydraulic couplings. 3 credit hours.

ME 438 Systems Dynamics and Control
Prerequisites: ME 321, ME 344. Modeling, analysis and design of dynamic systems with feedback. Response and stability analysis. Methods include Routh-Hurwitz, root locus, Bode plots, Nyquist stability criterion. Design and compensation methods. Applications in mechanical, thermal, electrical systems. Project. 3 credit hours.

ME 443 Introduction to Flight Propulsion
Prerequisites: ME 422 and consent of instructor. A senior course designed for those students who intend to work or pursue further studies in the aerospace field. Among the topics covered are: detonation and deflagration, introductory one-dimensional nonsteady gas flows, basic concepts of turbomachinery and survey of contemporary propulsive devices. Shock tube, supersonic wind tunnel and flame propagation demonstrations accompany the lectures. 3 credit hours.

ME 450 Special Topics in Mechanical Engineering
Prerequisite: consent of instructor. In-depth study of topics chosen from areas of particular and current interest to mechanical engineering students. 1-6 credit hours.

ME 512 Senior Seminar

Open to seniors with chair's approval. Individual oral presentations by students of material researched on topics selected by students and faculty at the beginning of the term. 3 credit hours.

ME 599 Independent Study (D)
Prerequisites: consent of faculty supervisor and approval of department chair. Independent study provides an opportunity for the student to explore an area of special interest under faculty supervision. 1-3 credit hours per semester with a maximum of 12.

MANAGEMENT

MG 115 Fundamentals of Management
A course in introductory management that explores the basics of both theory and practice. Topics include and are related ro the five functions of management: planning, organizing, staffing, leading and controlling. *Enrollment limited to nonbusiness majors and/or A.S. Business Administration students only.* 3 credit hours.

MG 120 Development of American Sports
A survey of the American sports industry and how it relates to society: issues and problems in national and international sport activities. An analysis of current sport issues and trends. 3 credit hours.

MG 310 Management and Organization
Prerequisites: A101, A102 or A 112, EC 133, EC 134 and junior standing. A study of management systems as they apply to all organizations. Managerial functions, principles of management, and other aspects of the management process are examined. 3 credit hours.

MG 317 Entrepreneurship and New Business Development
Prerequisite: MG 310. Covers the entrepreneurial process from the conception to operation of a new business. It will concentrate on the characteristics of entrepreneurs and the process by which they turn ideas into new business. Students will also learn about the process of new business developmenr in the large corporation and study the effect of corporate culture on the success of new ventures. 3 credit hours.

MG 327 Business Planning
Prerequisite: MG 317. Covers the element of planning for a new business. It identifies the goals, objectives and strategies that an entrepreneur must articulate toward the fulfillment of that entrepreneurial dream. The main focus of the course is to highlight the milestones toward the success of the new venture. 3 credit hours.

MG 330 Management of Sports Industries
Prerequisite: MG 120 and junior standing. A survey of the principles of management applicable to the administration of aspects of sports enterprises: planning, controlling, organizing, staffing and directing of the various activities necessary for effective functioning. 3 credit hours.

MG 331 Management of Human Resources
Prerequisite: MG 310. A survey of the industrial relations and the personnel management system of an organization. Manpower planning/forecasting, labor markets, selection and placement, training and development, compensation, government/employer and labor/management relations. 3 credit hours.

MG 332 Labor Management Relations
Prerequisites: MG 310, MG 331. A study of the development of American trade unions and the various stages of their relationship with business ownership and management, their structure and strategies, labor legislation and their impact. Negotiations strategies; causes of and strategies for resolving labor conflict. Attaining union-management cooperation. 3 credit hours.

MG 333 Management of Compensation
Prerequisite: MG 310, MG 331. A study of all aspects of the compensation process: criteria used in developing pay scales, merit systems and fringe benefits; techniques for administration and control of established systems. 3 credit hours.

MG 335 Public Relations in Sports
Prerequisite: MG 120 and junior standing. A study of individual and group behavior as they relate to the press, politicians, parents, broadcasting and other groups that require interpersonal relationships in daily decision making. 3 credit hours.

MG 350 Management of Workforce Diversity
Prerequisite: MG 310. This course explores issues of social identity, social and cultural diversity, and societal manifestations of oppression as they relate to the workplace. Workforce demographics are rapidly evolving due to changes in birthrates, immigration, legal systems, social attitudes, and economic expansion. Managing businesses and other organizations will require not just contemporary knowledge and technology, but will require the expertise to manage increasing workforce diversity. 3 credit hours.

MG 415 Multinational Management
Prerequisites: IB 312, MG 310. An analysis and examination of management and organizational behavior against a background of diversified cultural systems. 3 credit hours.

MG 417 Managing an Entrepreneurial Venture
Prerequisites: FI 313, MG 317. Covers the principles of managing a growing entrepreneurial business. Students will learn how to anticipate and deal with problems peculiar to a growing business. The emphasis will be on innovation, creativity and managing opportunities, in contrast to management of ongoing business that is based on efficiency and effectiveness. 3 credit hours.

MG 420 Sports Facility Management
Prerequisites: MG 120, MG 310. An examination of how sports facilities like coliseums, municipal and college stadiums, and multipurpose civic centers are managed. Among the topics included are: financial management of sports facilities, booking and scheduling events, box office management, staging and event production, personnel management, concessions and merchandising management. 3 credit hours.

MG 425 Sports Industries and the Law
Prerequisites: MG 120, MG 310. Legal aspects as they relate to professional and amateur sport institutions. An analysis of legal problems and issues confronting the sports manager: suits against the organizational structure, safety, collective bargaining and arbitration, and antitrust violations. 3 credit hours.

MG 430 Financial Management for Sports Administration
Prerequisite: FI 313, MG 310. Methods and procedures as they apply to sports administration, taxation, purchasing, cost analysis, budgering and the financial problems dealing with mass media. 3 credit hours.

MG 450-454 Special Topics in Business
Prerequisite: MG 310. Junior-level standing required unless specified in course schedule description. Special studies in business and public administration. Work may include study and analysis of specific problems within units of business or government and application of theory to those problems, programs of research related to a student's discipline, or special projects. Several sessions may run concurrently. 3 credit hours.

MG 455 Total Quality Management
Prerequisite: MG 310, QA 217. This course is an introduction to Total Quality Management concepts and techniques. Achieving employee involvement, low cost production, reducing low quality deficiencies, and increasing customer satisfaction will be the main focus of the course. 3 credit hours.

MG 457 Family Business Management
Prerequisite: MG 310. Provides a fundamental understanding of family business management, including historical and theoretical rudiments; transition stages, conflict resolution; family systems; and succession. Case studies of classic family businesses will be used for discussion and analysis. 3 credit hours.

MG 467 Franchising
Prerequisites: FI 313, MG 310.

Covers the franchising operation both from the franchiser's and franchisee's perspectives. It provides the student the framework to evaluate the feasibility of extending a new business into a franchise and the potential profitability of engaging in a franchise operation. 3 credit hours.

MG 470 Management of Corporate Culture
Prerequisites: MG 310. A study of corporate culture. Its development and influence on business strategies, organizational performance, development and change, and effects on managerial effectiveness. 3 credit hours.

MG 512 Contemporary Issues in Business and Society
Prerequisite: MG 310 and senior standing. A rigorous examination of competing concepts of the role of business in society. A capstone, integrative course relating the firm to its environment including issues arising from aggregate social, political, legal and economic factors. 3 credit hours.

MG 515 Management Seminar
Prerequisite: MG 310 and senior standing. Introduction to contemporary publications and the findings of research study reports. Analysis, interpretation and determination of impact of publications on the theory and practice of management. 3 credit hours.

MG 517 Practical Field Studies
Prerequisite: MG 417. Practical training for students minoring in Entrepreneurship. Students will have an opportunity to apply their conceptual knowledge to a real business situation. This course is restricted to seniors. 3 credit hours.

MG 520 Current Issues in Human Resource Management
Prerequisites: MG 310, MG 331. Examine research findings and current literature relevant to issues affecting personnel functions in the organization. 3 credit hours.

MG 550 Business Policy
Prerequisites: FI 313, MG 310, MK 300. An examination of organizational policies from the viewpoint of top-level executives, and a development of analytic frameworks for achieving the goals of the total organization. Discussion of cases and development of oral and written skills. 3 credit hours.

MG 597 Practicum
Prerequisite: MG 310 or MG 330. A required course in certain programs and majors that provides opportunity for students to develop networks and gain practical experience within a selected focus industry. 3 credit hours.

MG 598 Internship
Prerequisite: MG 310. On-the-job experience in selected organizations in management. 3 credit hours.

MG 599 Independent Study
Prerequisite: MG 310. Independent study on a project of interest to the student under the direction of a faculty member designated by the department chair. 3 credit hours.

MARKETING

MK 300 Principles of Marketing
Prerequisites: EC 133 or EC 134 and junior standing. The fundamental functions of marketing involving the flow of goods and services from producers to consumers. Marketing methods of promotion, pricing, product decisions and distribution channels. 3 credit hours.

MK 302 Organizational Marketing
Prerequisite: MK 300. Practices and policies in the distribution of industrial goods including purchasing, market analysis, channels of distribution, pricing, competitive practices and operating costs. 3 credit hours.

MK 305 Consumer Behavior
Prerequisite: MK 300. A study of the principal comprehensive marketing models which focus on buyer decision processes. Topics include brand switching decisions, measures of media effectiveness, market segmentation and other marketing techniques. 3 credit hours.

MK 307 Advertising and Promotion
Prerequisite: MK 300. The design, management and evaluation of the

various communications programs involved in marketing and public relations. 3 credit hours.

MK 316 Sales Management
Prerequisite: MK 300. The management of a sales organization. Recruiting, selecting, training, supervision, motivation and compensation of sales personnel. 3 credit hours.

MK 321 Retail Management
Prerequisite: MK 300. Survey of the problems and opportunities in the retail distribution field including a basic understanding of buying, selling and promotion of the retail consumer market. 3 credit hours.

MK 326 Overview of E-Commerce
Prerequisite: MK 300 and junior standing. A review of issues in e-commerce. Technologies available for digitalization and transmission are surveyed. Different uses of internets, intranets, extraners and Web pages are discussed. B2B sales and supply chain management are introduced. Available security and payment systems are compared. The impact of e-commerce and e-tail on business structure, channel conflicts, and alliances are introduced. 3 credit hours.

MK 327 E-Commerce Consumer Applications
Prerequisite: MK 300 and junior standing. E-commerce marketing to consumers sells physical, digital, and service products through the Internet. Key issues in selling these products will be discussed including advertising, privacy, intellectual property and contract issues. Web site usability will be examined. Students will create a simple Web page. Then, e-business software will be discussed and demonstrated for on-line catalog, inventory databases (ERP), transaction processing, customer records, shipping and security. 3 credit hours.

MK 402 Marketing of Services
Prerequisite: MK 300. The marketing of services, including services-based market planning, marketing mix, core marketing strategies and trends, and the essential differences between product and services-based marketing. 3 credit hours.

MK 442 Marketing Research in the Global Environment
Prerequisites: MK 300, QA 217. Research as a component of the marketing information system. Research design, sampling methods, data interpretation and management of the marketing research function. 3 credit hours.

MK 450 Special Topics
Prerequisite: MK 300, junior standing Coverage of new and emerging topics and applications in marketing theory and practice. The format may include both traditional classroom activities and innovative group projects. 3 credit hours.

MK 470 Marketing Channels
Prerequisite: MK 300. The design and administration of relationships for the successful distribution, shipping and inventory management of products, both domestically and internationally. Also included are channel conflicts and channel control. 3 credit hours.

MK 515 Marketing Management
Prerequisites: MK 300, MK 442 and senior standing. The analysis, planning and control of the marketing effort within the firm. Emphasis on case analysis. A marketing capstone course. 3 credit hours.

MK 598 Marketing Internship
Prerequisite: MK 300. Supervised field experience for qualified students in areas related to their major. 3 credit hours.

MK 599 Independent Study
Prerequisite: MK 300. A planned program of individual study under the supervision of a member of the faculty. 3 credit hours.

MULTIMEDIA

MM 301 Introduction to Multimedia
Prerequisite: introductory computer course (core curriculum requirement). The three goals of this course are: (1) to provide students with the necessary multimedia background and theory; (2) to discuss the basic building blocks of multimedia—text, images, animation, video and sound; and (3) to learn the practical elements of

making multimedia and the use of authoring software. 3 credit hours.

MM 311 Advanced Multimedia
Prerequisite: MM 301. This course will first deal with the advanced elements of multimedia. Hardware and software tools will be described in detail. Students will then be introduced to the step-by-step creative and organizing process that results in a finished multimedia project: the technology, user interface design and graphic production techniques. The course will emphasize such topics as how to structure information, how to anticipate user experience and how to generate visually compelling interfaces. 3 credit hours.

MM 401 Multimedia Seminar
Prerequisite: MM 311. This course will cover more advanced elements of multimedia. Current technical advances and artistic trends will be discussed in detail. Students will be reintroduced to the creative and organizing process that results in a finished multimedia project, and they will become familiarized with some of the software tools (HTML editors) used to design and implement an interactive Web page. 3 credit hours.

MM 450 Special Topics in Multimedia
Study of selected topics of special or current interest. 3 credit hours.

MARINE BIOLOGY

MR 200 Fundamentals of Oceanography
Prerequisites: BI 121-122 or BI 253-254, and CH 115-116. Investigation of the major aspects of geological, chemical, physical and biological oceanography. Human impacts are also reviewed. 3 credit hours.

MR 300 Marine Ecology with Laboratory
Prerequisites: BI 320, BI 350. Investigation of ecological structure and dynamics in marine and estuarine habitats at organismal, population, community and ecosystem levels. Geographic aspects and human interactions with marine ecosystems are also considered. Designed around specific topics covered in lecture, the laboratory includes investigation of different types of estuarine and coastal habitats, field and laboratory techniques, and design of basic and applied marine ecological investigations. Some required weekend field classes. Laboratory fee; 4 credit hours.

MR 310 Marine Botany with Laboratory
Prerequisites: BI 122 or BI 254, MR 200. A survey of plant and algae taxa inhabiting the marine and estuarine environment. Emphasis will be placed on the form and function of the major groups anad their adaptation to the marine environment. The laboratory section will include exercises in lower plant taxonomy and morphology. Experiments in plant physiology and field trips to study intertidal plant communities will be included. Laboratory fee; 4 credit hours.

MR 320 Marine Pollution
Prerequisite: MR 300. A classification of the different forms of pollution in the marine environment. The fate and transport of different pollutants will be discussed as will the effects of pollutants on coastal and open marine ecosystems. 3 credit hours.

MR 330 Coastal Resources and Management
Prerequisite: MR 300. Examination of natural coastal resources, human uses and alterations, federal and international regulations shaping activities in the coastal zone and coastal management at the international, federal, state and local levels. Some weekend field classes may be required. 3 credit hours.

MR 331 Marine Conservation and Restoration
Prerequisite: MR 300. An investigation into the conservation of marine resources and the science of habitat recovery and restoration. Topics will include fisheries conservation, case studies of restored coastal habitats, assessment procedures and evaluation of ecological function in restored habitats. 3 credit hours.

MR 410 Marine Aquaculture and Biotechnology

Prerequisite: MR 300. An examination of marine aquaculture and the use of marine resources in developing biotechnological products. The history of aquaculture and current aquaculture practices throughout the world are reviewed. Lectures are augmented by visits to commercial establishments and aquaculture research laboratories. The second portion of the course will focus on the development of marine biotechnology, marine products and the relationship between aquaculture and marine biotechnology. Some required weekend field classes. 3 credit hours.

MR 420 Marine Biogeochemistry with Laboratory
Prerequisites: CH 115-118, MR 300. A comprehensive study of the biogeochemistry of marine waters and sediments. Emphasis will be on biogeochemical cycling of key elements in marine and estuarine ecosystems and their role in global processes. Chemical analysis and field collection techniques together with experimentation into the partitioning of chemical species between sediment, water and biota will be conducted in the laboratory portion of the class. Laboratory fee; 4 credit hours.

MR 501-502 Senior Project in Marine Biology I and II
Prerequisite: marine biology major with senior standing. Individual/group-based research in marine biology. Students will develop specific research projects, conduct literature searches, plan and conduct experiments, analyze the data and present their findings in a written report and at a student conference at the end of the second semester. 3 credit hours each term.

MR 599 Independent Study
Prerequisites: marine biology major, consent of the department. Weekly conferences with adviser. Opportunity for the student, under the direction of a faculty member, to explore an area of personal interest. A written report of the work carried out is required. 3 credit hours.

MUSIC

MU 106 Chorus
Styles of group singing, survey of choral music literature from around the world. 3 credit hours.

MU 111 Introduction to Music
Basic forms and styles of music in the Western World: music appreciation. 3 credit hours.

MU 112 Introduction to World Music
Non-Western musical styles, their cultures and aesthetics; music of the indigenous cultures of the Americas and the advanced musics of the Near East and Far East; emphasis on India, the Orient, Southeast Asia, Africa and Indonesia. 3 credit hours.

MU 116 Performance
Open to all students interested in ensembles or private instruction. Students with adequate scholastic standing may carry this course for credit in addition to a normal program. 1-8 credit hours; maximum 3 credit hours per semester.

MU 125 Elementary Music Theory
A one-semester introduction to the basic principles of music, primarily for students who wish to gain insight into the fundamental structures and workings of the art form. Music majors who have not successfully passed the department placement examination must enroll in MU 125 and MU 126. Topics include notation, scales, key signatures, time signatures, staff recognition, intervals, triads. Non-music majors are not required to enroll in the laboratory. 3 credit hours.

MU 126 Elementary Music Theory Laboratory
Exercises in sight-singing, solfege, melodic and rhythmic dictation, and music notation. Should be taken concurrently with MU 125. 1 credit hour.

MU 150-151 Introduction to Music Theory I and II
Fundamentals of music: notation, physical and acoustical foundations; harmony and melody; modality, tonality, atonality; consonance and dissonance; tension; introductory composition; and ear training. 3 credit hours each term.

MU 175-176 Musicianship I and II
Prerequisites: MU 111 or MU 112; MU 150. Development of practical skills essential to performers and

ensemble directors: ear training, sight singing, dictation, transcription, arranging, notation, score writing. 3 credit hours each term.

MU 198-199 Introduction to American Music I and II
Music of the North American continent from the Puritans to the present day; both European and non-European musical traditions, with emphasis on twentieth-century developments. 3 credit hours each term.

MU 201-202 Analysis and History of European Art Music I and II
The growth of Western art music from its beginnings to the present day. Analysis of musical masterpieces on a technical and conceptual basis. 3 credit hours each term.

MU 211 History of Rock
Study of rock music as a musical tradition and social, political and economic phenomenon. Ethnomusicological and historical examination of rock from its pre-1955 roots to the present. 3 credit hours.

MU 221 Film Music
Designed for both music and communication majors. Introduction to the art, science and history of musical scores in film. Class work includes viewing and analysis of films with significant cuing and an introduction to the musical repertoire available to the film maker. 3 credit hours.

MU 250-251 Theory and Composition I and II
Investigation of music theory in various parts of the world, including the Western art tradition. Exercises in the composition of music within these theoretical constructs. Ear training and keyboard harmony. 3 credit hours each term.

MU 261 Introduction to the Music Industry
An introduction to the music industry from the artist's point of view. Provides guidance to musicians and/or songwriters trying to break into the record industry. Topics include: overview of the music industry, songwriting and publishing, the copyright law, music licensing, artist management: agents and attorneys, and recording contracts. 3 credit hours.

MU 299 Problems of Music
Music as an art form throughout the world. Music aesthetics and its relationship to the performance and composition of music. 3 credit hours.

MU 300 Studies in Music I
Area studies in music and its parent culture. Cultural theory as related to the music; instruments of the area and their etymologies; performance practices; the social role of music, both art and folk. Areas offered depend on availability of staff: China, Japan, the Near East, the Indian subcontinent, Africa, American Indian, Afro-American, Latin American, the Anglo-Celtic tradition and others. 3 credit hours.

MU 301 Recording Fundamentals
Prerequisite: CO 103, PH 100 or PH 150. A study of the fundamentals of sound recording technique and methodology: acoustics, basic electronics, the decibel, magnetism, microphones, microphone placement, tape recorders, tape formats, mixers, signal processing and monitoring systems. This course also emphasizes the importance of sound aesthetics and ethics in the sound recording process. 3 credit hours.

MU 311-312 Multitrack Recording I and II
Prerequisite: MU 301. Two semester course in the technique and methodology of multitrack studio and live recording. Includes detailed study of multiple tracking, mixing consoles, microphones, tape recorders, signal processors, studio procedures, sound synthesis, MIDI and digital audio. Also emphasizes the use of computers in the recording studio. Laboratory fee; 3 credit hours per semester.

MU 321 Sound Synthesis/MIDI
Prerequisite: MU 301. A study of the use of synthesizers, drum machines, sound modules and computers in the recording studio. Using a combination of lecture/demonstrations as well as lab hours, students will explore the physics of sound, sound synthesis, instrument control, Musical Instruments Digital Interface (MIDI) and computers. Special emphasis will be placed on current sequencing, notation and printing software. 3 credit hours.

MU 350 Studies in Music II
Area studies in musical forms; their history, evolution, and resultant metamorphoses; performance practices and extant forms. Areas offered depend upon availability of staff. 3 credit hours.

MU 361 Production, Promotion and Distribution
Prerequisite: MU 261. An overview of the music industry from the record company's perspective. Provides guidance to music enthusiasts who want to become record company executives, sales managers, producers, etc. Topics include: record company administration; business aspects of record production; promotion, publicity, and distribution; recording studio management; radio station programming and management; music videos; the retail music store. 3 credit hours.

MU 362 Legal Issues, Copyrights and Contracts
Prerequisite: MU 261. A comprehensive overview of the legal procedures, timings and agreements used in the music industry. Includes detailed study of the current copyright law, publishing contracts, licensing, the manager and/or agent agreement, the record company contract, AFM and AFTRA agreements, and ethical considerations in the music industry. 3 credit hours.

MU 401-402 Recording Seminar/Project I and II
Prerequisite: MU 312. Each student will complete a professional quality recording production or research and development project. Work may consist of internship or Co-op experience in a professional recording studio. Seminar will also include presentations on areas of professional interest such as career opportunities and new development in studio technique and technology. Laboratory fee; 3 credit hours each term.

MU 416 Advanced Performance
Prerequisite: consent of the department staff and a faculty adviser. Preparation and presentation of an instrumental or vocal performance indicating sufficient proficiency to warrant the awarding of a degree in music. 3 credit hours.

MU 450 Special Topics in Music
Study of selected topics of special or current interest. 3 credit hours

MU 461-462 Internship in the Music Industry I and II
Prerequisite: MU 361 and MU 362. The purpose of this course is to provide the student with advanced on-the-job training via placement as an apprentice/intern in music industry companies such as recording studios, radio stations, music stores, record companies, etc. 3 credit hours each term.

MU 500-502 Seminars in Advanced Research
Prerequisite: permission of instructor. Bibliographical studies of major world music areas; investigation of current and historical musicological theories, analysis and criticism of musicological area literatures. 3 credit hours each term.

MU 550 Studies in Urban Ethnic Music
Prerequisite: consent of instructor. The music tradition of inner-city ethnic groups; emphasis on the operation of the oral tradition in the preservation of cultural values and customs as evidenced through music. Classroom discussion will be balanced by field research in the urban vicinity. 3 credit hours.

MU 599 Independent Study
Opportunity for the student under the direction of a faculty member to explore an area of personal interest. This course must be initiated by the student. 1-3 credit hours per semester with a maximum of 12 hours.

PSYCHOLOGY

P 111 Introduction to Psychology
Understanding human behavior. Motivation, emotion, learning, personality development and intelligence as they relate to normal and deviant behavior. Applying psychological knowledge to everyday personal and societal problems. 3 credit hours.

P 212 Business and Industrial Psychology
Prerequisite: P 111. Psychological principles and research as they apply to the problems of working with people in organizations.

Analysis of problems and decisions in this use of human resources, including selection and placement, criterion measurement, job design, motivation. 3 credit hours.

P 216 Psychology of Human Development
Prerequisite: P 111. Human development over the life cycle–conception through death: the changing societal and institutional framework, key concepts and theoretical approaches, understanding development through biography, child rearing and socialization here and abroad. 3 credit hours.

P 301 Statistics for the Behavioral Sciences
Prerequisite: M 127. Concepts and assumptions underlying statistical methods essential to design and interpretation of research on human subjects. Fundamental descriptive and inferential methods. This course includes training in the use of a computer statistics program. 4 credit hours. (This course is crosslisted with M 228 Elementary Statistics.)

P 305 Experimental Methods in Psychology
Prerequisite: P 301. Methods of designing and analyzing psychological experiments. The scientific method as applied to psychology. Consideration of research techniques, experimental variables, design problems, data analysis. This course includes training in the use of a computer statistics program. 3 credit hours.

P 306 Psychology Laboratory
Prerequisite: P 305. Group and individual experiments to be carried out by students. Research techniques for studying learning, motivation, concept formation. Data analysis and report writing. Offered only in spring semester of odd-numbered years. 3 credit hours.

P 315 Human and Animal Learning
Prerequisite: P 111. Different types of human and animal learning. Learning as an adaptive mechanism. Psychological principles underlying learning. Practical applications of learning principles. 3 credit hours.

P 316 The Psychology of Health and Sport
Prerequisite: P 111. The role of psychological factors in the cause and prevention of physical illness. The modification of unhealthful behaviors. The study of stress and the management of stress, particularly during athletic competition. The nature of pain and pain management. The role of emotion in athletic performance. The use of psychology in athletic performance enhancement. Threats to the health of athletes. 3 credit hours.

P 321 Social Psychology
Prerequisites: P 111, SO 113. The interdependence of social organizations and behavior. The interrelationships between role systems and personality; attitude analysis, development and modification; group interaction analysis; social conformity; social class and human behavior. Offered only in the spring semester of odd-numbered years. 3 credit hours. (Same course as SO 320).

P 330 Introduction to Community Psychology
Prerequisite: P 111. Key concepts of community psychology/community mental health. Community problems, needs and resources. The helping relationship. Intervention techniques. Programming services. Understanding behavioral differences. Careers in community psychology. 3 credit hours.

P 331-332 Undergraduate Practicum I and II in Community/Clinical Psychology
Corequisites: P 330 or permission of instructor. Supervised field experience in community psychology/mental health settings. Exploration of service delivery. Development of basic repertoire of helping skills. Behavioral log. Project reporting. Understanding helping roles at individual, small group and institutional levels. 1-6 credit hours with a maximum of 3 credit hours per semester.

P 336 Abnormal Psychology
Prerequisite: P 111. Psychological and organic factors in personality disorganization and deviant behavior. Psychodynamics and classifications of abnormal behavior. Disorders of childhood, adolescence and old age. Evaluation of therapeutic methods. 3 credit hours.

P 341 Psychological Theory
Prerequisite: P 111. Contemporary theory in psychology. Emphasis on those theories which have most influenced thinking and research in sensation, perception, learning, motivation, personality. Offered only in fall semester of odd-numbered years. 3 credit hours.

P 350 Human Assessment
Prerequisite: P 301. Basic principles of measurement, applied to problems of the construction, administration and interpretation of standardized tests in psychological, educational and industrial settings. Offered only in fall semester of odd-numbered years. 3 credit hours.

P 351 Behavior Therapies
Prerequisite: P 111. Principles of therapeutic behavior management. Alteration of maladaptive behavior patterns in institutional, neighborhood, home, educational and social settings by operant and respondent reinforcement techniques. Habit management in oneself and one's children. Offered only in the spring semester of even-numbered years. 3 credit hours.

P 361 Behavioral Neuroscience
Prerequisites: P 111; BI 121 and BI 122. Endocrinological, neural, sensory and response mechanisms involved in learning, motivation, adjustment, emotion and sensation. Offered only in spring semester of even-numbered years. 3 credit hours.

P 370 Psychology of Personality
Prerequisites: P 111, junior class status. Theory and method in the understanding of normal and deviant aspects of personality; theories of Freud, Jung, Rogers, neo-Freudians and others. 3 credit hours.

P 375 Foundations of Clinical/Counseling Psychology
Prerequisite: P 336. Foundations of clinical/counseling psychology will review the humanistic, psychoanalytic, and behaviorist views on the emergence and treatment of psychopathology. The fit between theory and technique will be explored. 3 credit hours.

P 480-484 Special Topics in Psychology
3 credit hours.

P 599 Independent Study
Prerequisites: consent of faculty member and department chair. Opportunity for the student under the direction of a faculty member to explore an area of personal interest. This course must be initiated by the student after conferring with the faculty member who has agreed to supervise the project. 1-3 credit hours.

PUBLIC MANAGEMENT

PA 101 Introduction to Public Administration
The nature of and problems involved in the administration of public services at the federal, state, regional and local levels. 3 credit hours.

PA 302 Public Administration Systems and Procedures
The major staff management functions in government and in nonprofit agencies: planning, budgeting, scheduling and work analysis. 3 credit hours.

PA 305 Institutional Budgeting and Planning
Budgeting as an institutional planning tool, as a cost control device and as a program analysis mechanism is stressed. Attention is given to the salary expense budget, the revenue budget, the capital budget and the cash budget. 3 credit hours.

PA 307 Urban and Regional Management
Methods and analysis of decision making related to urban and regional problems. Topics include housing, land use, economic development, transportation, pollution, conservation and urban renewal. 3 credit hours.

PA 308 Health Care Delivery Systems
An examination of the health care delivery systems in the U.S., including contemporary, economic, organizational, financing, manpower, cost and national health insurance issues. 3 credit hours.

PA 404 Public Policy Analysis
Using the public perspective,

examines the nature of the public policy process from policy formation through policy termination. Major emphasis on the techniques commonly used in analyzing public policy including cost/benefit analysis and comparison of expected and actual outcomes. An opportunity to gain "hands on" experience in the analysis and evaluation of public policy. 3 credit hours.

PA 405 Public Personnel Practices
Study of the civil service systems of the federal, state and local governments including a systematic review of the methods of recruitment, evaluation, promotion, discipline, control and removal. 3 credit hours.

PA 408 Collective Bargaining in the Public Sector
Analysis of collective bargaining in the public sector, with emphasis on legislation pertaining to government employees. 3 credit hours.

PA 450-455 Special Topics
Selected topics of special or current interest in the field of public management. 3 credit hours.

PA 490 Public Health Administration
An examination of public health activities, including public health organization, environmental health, disease control, use of information systems and social services. 3 credit hours.

PA 512 Seminar in Public Administration
Selected topics related to public administration are chosen for study in depth. 3 credit hours.

PA 598 Public Administration Internship
Prerequisite: consent of the co- ordinator. Monitorial field experience with public and not-for-profit agencies. Minimum of 3 credit hours.

PA 599 Independent Study
Independent study on a project of interest to the student under the direction of a faculty member approved by the department chair. 3 credit hours.

PHYSICS

PH 100 Introductory Physics with Laboratory
Prerequisite or corequisite: M109 or equivalent math competency. A one-semester introduction to the science of physics primarily for liberal arts, business and hospitality/tourism students. The course provides a broad, algebra-based understanding of the basic laws of nature, their application to our everyday lives and their impact on our technological society. Laboratory fee; 4 credit hours.

PH 101 Energy–Present and Future
Intended primarily for business and liberal arts students. Explores the nature, role and economic impact of energy in our society. Topics include: the nature and growth of energy consumption, physical limits to energy production and consumption, environmental effects and comparisons of energy alternatives. Special emphasis on the technical, environmental and economic aspects of nuclear power as well as energy sources of the future such as fast breeder reactors, fusion, solar and geothermal power. 3 credit hours.

PH 103-104 General Physics I and II with Laboratory
Primarily for life science majors with no calculus background. Basic concepts of classical physics: fundamental laws of mechanics, heat, electromagnetism, optics, and conservation principles. Introduction to modern physics: relativity and quantum theory, atomic, nuclear and solid-state physics. Application of the physical principles to life sciences. Laboratory fee; 4 credit hours per term.

PH 150 Mechanics, Heat and Waves with Laboratory
Prerequisite: M 117. Introductory course for physical science and engineering majors. Kinematics, Newton's laws, conservation principles for momentum, energy and angular momentum. Thermal physics. Basic properties of waves, simple harmonic motion, superposition principle, interference phenomena and sound. Laboratory fee; 4 credit hours.

PH 203 The Physics of Music and Sound with Laboratory
Prerequisites: PH 100, PH 103,

PH 150 or equivalent. A second semester course in physics for students with music and sound recording majors and others with a special interest in music, acoustics, or sound and hearing. Study of the physics underlying such things as the production of sound by musical instruments, electromagnetic storage and reproduction of sound, human hearing, and acoustics of concert halls and other spaces. Integrated laboratory experiments provide hands-on experience of these phenomena. Laboratory fee; 4 credit hours.

PH 205 Electromagnetism and Optics with Laboratory
Prerequisites: PH 150, M 118. Basic concepts of electricity and magnetism; Coulomb's law, electric field and potential, Gauss's law, Ohm's law, Kirchoff's rules, capacitance, magnetic field, Ampere's law, Faraday's law of induction, Maxwell's equations, electromagnetic waves. Fundamentals of optics; light, laws of reflection and refraction, interference and diffraction phenomena, polarization, gratings, lenses and optical instruments. Laboratory fee; 4 credit hours.

PH 207 Engineering Physics
Prerequisites: One full year of non-calculus physics with laboratories, two semesters of calculus. A one-semester course primarily for engineering transfer students who had one-year non-calculus physics sequence in two-year colleges and technical schools. All the major topics of PH 150-PH 205 are covered with an ample use of calculus. PH 207 should not be used as a technical elective. 4 credit hours.

PH 211 Modern Physics
Prerequisite: PH 205. Modern physics fundamentals. Twentieth century developments in the theory of relativity and the quantum theory. Atomic, nuclear, solid-state and elementary particle physics. 3 credit hours.

PH 270 Thermal Physics
Prerequisite: PH 103 or PH 150. Basic thermodynamics and its applications. Major emphasis on the efficiency of energy conversion and utilization. Topics include: the laws of thermodynamics, entropy, efficiency of heat engines, solar energy, the energy balance of the earth, energy systems of the future, economics of energy use. 3 credit hours.

PH 280 Lasers
Prerequisite: PH 205. Laser theory, holography, construction and application to latest engineering and scientific uses. 3 credit hours.

PH 285 Modern Optics
Prerequisite: PH 205. Introduction to optical theories. Topics on the latest developments in optics. Application to life sciences and engineering. 3 credit hours.

PH 301 Analytical Mechanics
Prerequisite: PH 150, M 204, or instructor's consent. This is an intermediate-level course in Newtonian mechanics. Selected topics include the formulation of the central force problem and its application to planetary motion and to scattering, theory of small oscillations, dynamics of rigid body motion, and an introduction to Lagrangian and Hamiltonian formalism. 3 credit hours.

PH 303 Radioactivity and Radiation
Intended for students in occupational safety and health, fire science, forensic science and related fields as well as for science and engineering students with interest in this area. Topics include: the nature of radiation and radioactivity, the interaction of radiation with matter, biological effects of radiation, detection and measurement of radiation, shielding considerations, dosimetry and standards for personal protection. 3 credit hours.

PH 401 Atomic Physics
Prerequisite: PH 211. Structure and interactions of atomic systems including Schrodinger's equation, atomic bonding, scattering and mean free path, radiative transitions and laser theory. 3 credit hours.

PH 406 Solid-State Physics
Prerequisite: PH 211. Introduction to the physics of solids with emphasis on crystal structure, lattice vibrations, band theory, semiconductor, magnetism and superconductivity. Applications to semiconductor devices and metallurgy. 3 credit hours.

PH 415 Nuclear Physics
Prerequisite: PH 211 or consent of instructor. Elementary nuclear physics. Nuclear structure, natural radioactivity, induced radioactivity, nuclear forces and reactions, fission and fusion, reactors and topics of special interest. 3 credit hours.

PH 450 Special Topics in Physics
Study of selected topics of special or current interest. 3 credit hours.

PH 451 Elementary Quantum Mechanics
Prerequisite: PH 211 or consent of instructor. An elementary treatment of nonrelativistic quantum mechanics. Schrodinger's equation with its applications to atomic and nuclear structure; collision theory; radiation; introductory perturbation theory. 3 credit hours.

PH 470 Theory of Relativity
Prerequisite: PH 211 or consent of instructor. Introduction to Einstein's theory of relativity. Special theory of relativity; Lorentz transformations, relativistic mechanics and electromagnetism. General theory of relativity; equivalence principle, Einstein's three tests, graviton, black hole and cosmology. 3 credit hours.

PH 599 Independent Study
Prerequisites: consent of faculty member and department chair. Opportunity for the student under the direction of a faculty member to explore an area of personal interest. This course must be initiated by the student. 1-3 credit hours.

PHILOSOPHY

PL 201 Philosophical Methods
The nature of reality and how it may be known, according to the great thinkers of the Occident and the Orient. 3 credit hours.

PL 205 Classical Philosophy
The origins of philosophy and the continuing influence of classical thought on the development of ideas. 3 credit hours.

PL 206 Modern Philosophy: Descartes to the Present
Philosophical theories that have dominated the modern age. Stress on a central figure of the period. 3 credit hours.

PL 210 Logic
Modern symbolic logic and its applications. 3 credit hours.

PL 215 Nature of the Self
Investigation of personal identity, human nature and the mind from ancient, modern, Western and Eastern perspectives. 3 credit hours.

PL 222 Ethics
How shall one live? Critical examination of answers proposed by classic and modern philosophers of the major world traditions. 3 credit hours.

PL 223 Ethics and Business
How ethics and other values function in their relation to business enterprise. 3 credit hours.

PL 240 Philosophy of Science and Technology
Scientific method, the logic of scientific explanation, the application of science to practical problems and questions peculiar to the social sciences. 3 credit hours.

PL 250 Philosophy of Religion
An examination of some philosophical notions used in religious discourse, such as meaning, truth, faith, being, God, the holy. 3 credit hours.

PL 256 Analysis and Criticism of the Arts
The language used to talk about works of art: form, content, expression, value and the ontological status of the art object. 3 credit hours.

PL 416 Computer Ethics
Prerequisite: junior or senior standing. A critical examination of ethical theories and their application to the uses of computers and information technology. Issues include professional ethics, privacy, responsibility, access, property rights, computer crime and social implications. (See also CS 416.) 1 credit hour.

PL 450 Special Topics in Philosophy
Study of selected topics of special or current interest. 3 credit hours.

PL 599 Independent Study
Opportunity for the student under the direction of a faculty member

to explore an area of interest. This course must be initiated by the student. 1-3 credit hours.

POLITICAL SCIENCE

(†) *indicates Institute of Law and Public Affairs courses.*

PS 101 Introduction to Politics
A basic course introducing students to the discipline of political science and its subjects: political theory, law, national government, international relations, comparative government and political economy. 3 credit hours.

PS 121 American Government and Politics
A basic study of the American political system. Constitutional foundations, the political culture, Congress, the Presidency, the judicial system, political parties, interest groups, news media, individual liberties, federalism, the policy-making process. 3 credit hours.

PS 122 State and Local Government and Politics
Problems of cities, revenue sharing, community power structures, welfare, public safety, the state political party, big-city political machines, interest groups, state legislatures, the governor, the mayor, courts and judicial reform. 3 credit hours.

PS 203 American Political Thought
Pre-Revolutionary and Revolutionary political thought; classical conservatism, liberalism, Jacksonian democracy, civil disobedience, social Darwinism, progressive individualism and pluralism. 3 credit hours.

PS 205 The Politics of the Black Movement in America
The political development of the Black Movement in America emphasizing ideological, legal and cultural perspectives. 3 credit hours.

PS 216 Urban Government and Politics
A study of the urban political process. Structures and organizations of urban governments, decision making, public policy, the "urban crisis," crime and law enforcement, party politics and elections, taxation and spending patterns, environmental problems, management of urban development. 3 credit hours.

PS 222 United States Foreign Policy
An examination of the global foreign policy of the United States and of the process of policy making involving governmental and non-governmental actors. A review of the political, economic, military and cultural tracks of policy. 3 credit hours.

†PS 224 Public Attitudes and Public Policy
A study of the sources of mass political attitudes and behavior and their effect upon public policy. The course will examine the techniques for influencing opinion including propaganda and mass media communications. 3 credit hours.

†PS 226 Family Law
A study of legal relations between husband and wife including marriage, annulment, divorce, alimony, separation, adoption, custody arrangements and basic procedures of family law litigation. 3 credit hours.

†PS 228 Public Interest Groups
Examination of American group institutions of the American political culture. Emphasis on the legal nature, purpose and function of each operational organization in the political process. 3 credit hours.

†PS 229 Legal Communications
Familiarization with the kinds of legal documents and written instruments employed by participants in the legal process. Recognization and understanding of the purpose of writs, complaints, briefs, memoranda, contracts, wills and motions. 3 credit hours.

†PS 230 Anglo-American Jurisprudence
Surveys ideas about the nature of law. Legal philosophers examined include: Plato, Aristotle, St. Thomas Aquinas, John Austin, William Blackstone, Benjamin

Cardozo, L.A. Hart and Oliver Wendell Holmes. The contribution to legal theory made by various schools of jurisprudence (e.g., positivism, legal realism). 3 credit hours.

†PS 231 Judicial Behavior
Examination of the American court system as a political policy-making body. Topics considered include: the structure of the judicial system, the influence of sociological and psychological factors on judicial behavior, and the nature and impact of the judicial decision-making process. 3 credit hours.

PS 232 The Politics of the First Amendment
Prerequisite: PS 121. Examination of the political implications of the First Amendment freedoms of speech, press and religion; Supreme Court adaptation of the First Amendment to changing political social conditions. 3 credit hours.

†PS 238 Legal Procedure I
This course is designed to provide a practical knowledge of civil procedure for the pre-law and/or paralegal student. 3 credit hours.

†PS 239 Legal Procedure II
An introduction to litigation techniques and procedures, including skills needed to negotiate for civil and criminal actions. 3 credit hours.

†PS 240 Legal Bibliography and Resources
An introduction to legal bibliographical materials. Students will learn how to use various kinds of law books in solving research problems incident to advising clients and trying and appealing cases. The function of court reports, statutes, codes, digests, citators, loose-leaf services and treatises will be discussed. 3 credit hours.

PS 241 International Relations
Forces and structures operating in the modern nation-state system, the foreign policy process, decision-making process, the impact of decolonization on traditional interstate behavior, economic and political developments since World War II. 3 credit hours.

PS 243 International Law and Organization
Prerequisite: PS 241. Traditional and modern approach to international law and organization; major emphasis on the contribution of law and organization to the establishment of a world of law and world peace. The League of Nations system and the United Nations system are analyzed. 3 credit hours.

†PS 244 Estates and Trusts
An examination of the legal principles and techniques of effective estate planning and administration. Topics covered include inheritance statutes, preparation and execution of wills, and record keeping practices. 3 credit hours.

PS 261 Modern Political Analysis
Introduction to political analysis including quantitative and qualitative techniques, systems and data analyses, role and group theory, simulations and projections using computerized models. 3 credit hours.

PS 281 Comparative Political Systems: Asia
Traditional and modern political and social structures of China, Japan and Korea and other Asian states including the function of the political system within each country. 3 credit hours.

PS 282 Comparative Political Systems: Europe
Political characteristics of modern European states. Emphasis on political, social and economic institutions and structures. Special attention to European integration and the European Union; changes in Eastern Europe and the former USSR. 3 credit hours.

PS 283 Comparative Political Systems: Latin America
Political modernization, development in Latin America, political institutions, national identity, leadership, integration, political socialization and political ideologies. 3 credit hours.

PS 285 Comparative Political Systems: Middle East
Analysis of the Arab and non-Arab states in the region with particular attention to the political systems, violence, and the problems of tradition vs. modernity. 3 credit hours.

PS 304 Political Parties
Prerequisite: PS 121. Voting and

electoral behavior, nominations and campaign strategy, pressure groups, political party structure and functions of the party system in the American political community. 3 credit hours.

PS 308 Legislative Process
Prerequisite: PS 121. Legislative process in the American political system; legislative functions; selection and recruitment of candidates; legislative leadership, the committee system; lobbyists, decision-making; legislative norms, folkways and legislative executive relations. 3 credit hours.

PS 309 The American Presidency
The role of the President as commander-in-chief, legislative leader, party leader, administrator, manager of the economy, director of foreign policy and advocate of social justice; nature of presidential decision making, authority, power, influence and personality. 3 credit hours.

†PS 326 Real Estate Law
A variety of legal skills in real estate law. Special attention given to title, operations, mortgage, deeds, leases, property taxes, closing procedures and documents. 3 credit hours.

†PS 328 Legal Management and Administrative Skills
An examination of the procedures and systems necessary to run a law office efficiently. Students will learn such administrative skills as how to interview clients, conduct legal correspondence and maintain legal records. Proven management techniques for keeping track of filing dates and fees, court dockets and calendars are also examined. 3 credit hours.

†PS 330 Legal Investigation
Examines skills needed to conduct investigations that are a routine part of the practice of law such as principles of fact-gathering in a wide range of cases (e.g., criminal, divorce, custody, housing). 3 credit hours.

PS 331 Theory and the Supreme Court
An examination of the ways in which the Supreme Court exercises judicial review with particular emphasis on the various theories of review as they have evolved from John Marshall to the present. 3 credit hours.

PS 332 Constitutional Law
Prerequisite: PS 121. Principles and concepts of the United States Constitution as revealed in leading decisions of the Supreme Court and the process of judicial review. 3 credit hours.

†PS 340 Campaign Management: Procedures and Operations
A study of the procedures and operation of the contemporary political campaign including issue development, voter registration, canvassing, media usage, fundraising, scheduling, campaign data, etc. 3 credit hours.

†PS 341 Campaign Management: Structure and Organization
Exploration of the structure, organization and management of the campaign operation and the handling, roles and tasks of the campaign personnel. 3 credit hours.

†PS 344 Campaign Management: Survey Research, Polling and Computers
A study of the uses and interpretation of survey research, polling projects, computer techniques, and their application to political campaigns. 3 credit hours.

†PS 346 Campaign Management: Financing and Election Laws
Exploration of the methods used to finance a political campaign; the nature of campaign costs; the role of political action committees; the effects of campaign finance laws; and the technical aspects and political implications of election laws at the federal, state and local levels. 3 credit hours.

PS 350 Public Policy: U.S. National Security
The development and operation of U.S. military and national security policy from George Washington to the present with the major emphasis on the 20th century and post-World War II 3 credit hours.

PS 355 Terrorism
Examination of the modern application of terrorism in international affairs paying special attention to the ideological and infrastructure determinants. 3 credit hours.

PS 390 Political Modernization
Comparative analysis of political change and development. Political transition, political integration and nation building; institutional developments; political parties; military elites; youth; intellectuals; the bureaucracy; economic development; and political culture. 3 credit hours.

†PS 415 Internship in Legal and Public Affairs
Students will have the opportunity to work as paraprofessionals in law offices, government agencies, and party organizations, and to share their experiences with other interns in legal and public affairs. Permission of the instructor is required. 3 credit hours.

†PS 430 Computers and the Law
An analysis of the ways in which the advent of the computer has affected law and the legal profession. Students will explore methods of using computers for legal research, the effects of computers on criminology and the administrarion of justice, the impact of mass data banks on the right to privacy and the freedom of choice. 3 credit hours.

†PS 440 Legal Research
Prerequisite: PS 240. Practical experience in researching and writing on realistic legal problems. Specific written assignments make use of all the library tools. How to prepare and analyze legal memoranda and briefs. 3 credit hours.

†PS 450 Campaign Management: Internship
Actual work experience in campaign management. 3 credit hours.

PS 461 Political Theory: Ancient and Medieval
Foundations of Western political thought from the Greek, Roman and medieval experiences as it applies to the total discipline of political science. 3 credit hours.

PS 462 Political Theory: Modern and Contemporary
A continuation of the study of political thought from the High Middle Ages to the contemporary theorists. 3 credit hours.

PS 494-498 Special Topics in Political Science
Special studies on a variety of current problems and specialized areas in the field not available in the regular curriculum. 3 credit hours per course.

PS 499-500 Senior Seminar in Political Science I and II
Prerequisite: permission of department chair. Capstone course in which students use the tools of their discipline to examine a selected problem. May be conducted as a pro-seminar. Required of all political science majors. 3 credit hours per term.

PS 599 Independent Study
Directed research on special topics to be selected in consultation with the department chair and a sponsoring faculty member. 3 credit hours.

QUANTITATIVE ANALYSIS

QA 118 Business Mathematics
Prerequisites: M109/M127 or successful completion of qualifying placement test by mathematics department. An introduction to mathematical programming and probability and statistics. Topics include solutions to linear equations, break-even analysis, graphical solutions to linear programming problems, mathematical modeling, measures of central tendency and variability, and basic probability concepts. The course presents introductory material to QA 216. 3 credit hours.

QA 216 Probability and Statistics
Prerequisite: QA 118 or equivalent. A course in elementary probability and statistical concepts with emphasis on data analysis and presentation; frequency distributions; probability theory; probability distributions; sampling distributions; statistical inference; hypothesis testing. 3 credit hours.

QA 217 Advanced Statistics
Prerequisite: QA 216, A course in advanced statistical methods for business. Topics include the analysis of variance, multiple regression, an introducrion to the econometric model, times series analysis, chi-square and other nonparametric measures, and an introduction to robust estimation. Students will be required to use personal computers to apply the various statistical tech-

niques covered in the course. 3 credit hours.

QA 328 Quantitative Techniques in Management
Prerequisite: QA 217 and junior standing. An introduction to quantitative techniques in management. Topics include linear programming, assignment problems, transportation algorithms, network and inventory models, and decision theory. 3 credit hours.

QA 350 Quantitative Techniques
Prerequisites: QA 217 and junior standing. Advanced applications of quantitative techniques to the solution of business problems. Topics include: classical optimization techniques, non-linear programming, topics in mathematical programming, and graph theory. 3 credit hours.

QA 380 Operations Management
Prerequisite: QA 328. Basic review of service and production systems designs and performance evaluation. Topics include: operations strategy, staff and production scheduling, Just-in-Time and time-based competition, project management, and the role of technology in service and manufacturing operations.

QA 428 Forecasting for Decision Making
Prerequisite: QA 217 and junior standing. Review of different approaches to forecasting used by management at different levels of decision making. Techniques will include smoothing and decomposition, causal and judgmental methods. Computer applications and modeling will be emphasized. 3 credit hours.

QA 480 Project Management
Prerequisite: QA 328. Survey of management techniques applicable to a wide variety of business-related project types. Emphasis on the project management cycle including selecting, scheduling, budgeting and controlling projects. Desired qualifications and roles of project managers. Extensive use of project management software will be required. 3 credit hours.

QA 598 Internship
Prerequisite: QA 380. Supervised field experience for qualified students in an area related to operations management. 3 credit hours.

QA 599 Independent Study
Prerequisites: QA 118, QA 216, QA 217 and junior standing. Independent research projects or other approved forms of independent study. 3 credit hours.

RUSSIAN

RU 101-102 Elementary Russian I and II
Stresses pronunciation, aural and reading comprehension, basic conversation and the fundamental principles of grammar. 3 credit hours per term.

RU 201-202 Intermediate Russian I and II
Prerequisites: RU 101-102 or the equivalent. Stresses reading comprehension of modern prose texts and a review of grammar necessary for this reading. Students are encouraged to read in their own areas of interest. 3 credit hours per term.

SCIENCE

Courses that are marked with an asterisk (*) are usually scheduled every other academic year. Courses marked with this symbol (†) are offered at the discretion of the department.

†SC 111-112 Physical Science I and II
The meaning of scientific concepts and terms and their relation to other areas of learning and to daily living. Development and unity of physical science as a field of knowledge. Includes astronomy, physics, chemistry and geology. 3 credit hours per term.

***SC 126 Astronomy**
An introduction to present concepts concerning the nature and evolution of planets, stars, galaxies and other components of the universe. The experimental and observational bases for these concepts are examined. 3 credit hours.

†SC 135 Earth Science
A dynamic systems approach to phenomena of geology, oceanography and meteorology. Emphasis on

interrelations of factors and processes and on importance of subject matter to human affairs. Suitable for non science as well as for science majors. 3 credit hours.

OCCUPATIONAL SAFETY AND HEALTH

SH 100 Safety Organization and Management
History and development of the safety movement, nature and extent of the problem, development of worker's compensation, development of safety programs, cost analysis techniques, locating and defining accident sources, analysis of the human element, employee training, medical services and facilities, and the "what" and "how" of the Occupational Safety and Health Act. 3 credit hours.

SH 110 Accident Conditions and Controls
Prerequisite: SH 100. Mechanical hazards, machine and equipment guarding, boilers and pressure vessels, structural hazards, materials handling hazards and equipment use, electrical hazards, personal protective equipment. 3 credit hours.

SH 200 Elements of Industrial Hygiene
Prerequisites: PH 103, SH 110, CH 103 or CH 115. Analysis of toxic substances and their effect on the human body. Analysis and effect of chemical hazards, physical hazards of electromagnetic and ionizing radiation, abnormal temperatures and pressure, noise, ultrasonic and low-frequency vibration; sampling techniques including detector tubes, particulate sampling, noise measurement and radiation detection; governmental and industrial hygiene standards and codes. 3 credit hours.

SH 210 Sound/Hearing/Noise
Prerequisite: SH 200. An analysis of three major factors associated with the noise issue viz, the physics of sound, the biological phenomenon of hearing, and the engineering processes of noise abatement including a review of the OSHA legal standards for noise exposure. 3 credit hours.

SH 400 Occupational Safety and Health Legal Standards
Prerequisite: SH 100. All aspects of the legal constrains applicable to the occupational safety field. Includes OSHA, federal laws not under OSHA jurisdiction, selected state legislation, current and pending product liability laws, environmental protection law and fire safety codes. Emphasizes particular legal areas as requested. 3 credit hours.

SH 401 Industrial Hygiene Measurements
Prerequisite: SH 200. Current methods and techniques used in evaluating the occupational environment. Instruction on how to use the instruments necessary to measure ventilation, nonionizing radiation, airborne contaminants, noise and heat stress. Instruction on how to present data and prepare reports will also be included. 3 credit hours.

SH 500 Special Topics
Selected study topics of special or current interest. 3 credit hours.

SH 599 Independent Study
Prerequisites: consent of faculty member and chair of department. Opportunity for the student under the direction of a faculty member to explore an area of interest. This course must be initiated by the student. 1-3 credit hours.

SOCIOLOGY

SO 113 Sociology
The role of culture in society, the person and personality; groups and group behavior; institutions; social interaction and social change. 3 credit hours.

SO 114 Contemporary Social Problems
Prerequisite: SO 113 or consent of instructor. The major problems which confront the present social order, and the methods now in practice or being considered for dealing with these problems. 3 credit hours.

SO 115 Women in Society
An overview of women's role in the social system. Discussion includes myths and realities of sex differences. Areas covered include analysis of the relationship of women to

the economy, the arts, and the sciences and how these affect the behavior of women in the contemporary world. 3 credit hours.

SO 214 Deviance
Prerequisite: SO 113 or consent of the instructor. (Offered in the spring semester only.) Centered around deviance as a social product. The problematic nature of the stigmatization process is explored in such areas as alcoholism, crime, mental illness and sexual behavior. 3 credit hours.

SO 218 The Community
Prerequisite: SO 113 or consent of instructor. The community and its provisions for health, education, recreation, safety and welfare. Theoretical concepts of community, plus ethnographic studies of small-scale human communities, introduce students to fundamental concepts of community. 3 credit hours.

SO 220 Physical Anthropology and Archaeology
An introduction to the study of human evolution and of present physical variations among humankind. Includes geologic time, primate evolution and early humans and their culture. 3 credit hours.

SO 221 Cultural Anthropology
A systematic study of the culture of preliterate and modern societies and of cultural change. Includes analyses of religion, economics, language, social and political organization and urbanization. 3 credit hours.

SO 231 Juvenile Delinquency
Prerequisites: SO 113, P 111. This course is offered as CJ 221 in university schedules. An analysis of delinquent behavior in American society; examination of the theories and social correlates of delinquency, and the sociolegal processes and apparatus for dealing with juvenile delinquency. 3 credit hours. (Same course as CJ 221.)

SO 250 Research Methods
Prerequisite: sophomore status. The student develops the concepts necessary for selection and formulation of research problems in social science, research design and techniques, analysis and interpretation of research data. 3 credit hours.

SO 310 Primary Group Interaction
Prerequisite: SO 113. Exploration of communication in group process. Building a group and analyzing group structure and interaction; the ways people communicate emotionally and intellectually. 3 credit hours.

SO 311 Criminology
Prerequisites: P 111, SO 113. An introduction to the principles and concepts of criminology; analysis of the social context of criminal behavior, including a review of criminological theory, the nature and distribution of crime, the sociology of criminal law and the societal reactions to crime and criminals. 3 credit hours. (Same course as CJ 311.)

SO 312 Marriage and the Family
Prerequisite: SO 113 or the consent of instructor. The formation, functioning and dissolution of relationships in contemporary American society is examined from an applied sociology perspective. 3 credit hours.

SO 313 Sociology of Sport
Prerequisite: SO 113 or consent of instructor. A study of the relationships among sport, culture and society. Emphasis is on both amateur and professional sports and their impact on the larger social order. Course will examine sport from a comparative and historical perspective, but will also focus on problems confronting the world of sport in contemporary American society. 3 credit hours.

SO 315 Social Change
Prerequisite: SO 113 or consent of instructor. Sources, patterns and processes of social change with examination of classical and modern theories of major trends and developments as well as studies of perspectives on microlevels of change in modern society. 3 credit hours.

SO 320 Social Psychology
Prerequisites: P 111, SO 113. *This course is offered as P 321 in university schedules.* The interdependence of social organizations and behavior. The interrelationships between

role systems and personality; attitude analysis, development and modification; group interaction analysis; social conformity; social class and human behavior. 3 credit hours. (Same course as P 321.)

SO 321 Social Inequality
Prerequisite: SO 113 or consent of instructor. Organization of social class: status, power and process of social mobility in contemporary society. Social stratification, its functions and dysfunctions, as it relates to the distribution of opportunity, privilege and power in society. 3 credit hours.

SO 331 Population and Ecology
Prerequisite: SO 113 or permission of instructor. Societal implications of population changes and trends; impact of humans as social animals on natural resources, cultural values and social structures; their influence on environmental ethics. 3 credit hours.

SO 333 Sociology of Aging
Prerequisite: SO 113 or consent of instructor. The sociological phenomenon connected with aging in America. Discussion of the connections between personal troubles and social issues encountered by members of this society as they age. An examination of age stratification and the resultant problems of ageism, prejudice and discrimination. Systematic review of major theoretical framework and research studies; emphasis will be placed on the application of sociological theory and research in the field of aging. 3 credit hours.

SO 337 Human Sexuality
Prerequisite: SO 113 or consent of instructor. A scientific study of human sexual behavioral patterns, social class attitudes and cultural myths. Topics include reproductive systems, sexual attitudes and behavioral patterns, abortion and sexual laws, and variations in sexual functioning. 3 credit hours.

SO 340 Medical Sociology
Prerequisite: SO 113 or consent of instructor. An analysis of a major social institution, the health care field. Emphasis placed on sociocultural aspects of the field; general overview of the organization and delivery of health care services and the current problems and issues. 3 credit hours.

SO 350 Social Survey Research
Prerequisite: P 301 or M 228. Introduction to the logic of social science by a survey research project. Emphasis on the use of computer software in analyzing large data sets. Topics include theory development, survey design, sampling, methods of data collection and statistical analysis of social science data. This course is part of the computer literacy component of the University Core Curriculum. 3 credit hours.

SO 390 Sociology of Organizations
Prerequisite: SO 113 or consent of instructor. Classic sociological theories of organization with emphasis on the concepts of bureaucracy, scientific management, human relations and decision theory. The relevance of these ideas to concrete organization contexts, e.g., civil service, business, social movements and political parties, charitable institutions, hospitals. 3 credit hours.

SO 400 Minority Group Relations
Prerequisite: SO 113 or consent of instructor. An interdisciplinary analysis of minority groups with particular attention paid to those regional, religious and racial factors that influence interaction. Designed to promote an understanding of subgroup culture. 3 credit hours.

SO 413 Social Theory
Prerequisite: nine semester hours in sociology. An analysis of the development of sociology in the nineteenth and twentieth centuries with particular emphasis on the theories of Comte, Durkheim, Simmel, Weber, Marx, deTocqueville and others. 3 credit hours.

SO 418 Public Opinion and Social Pressure
Prerequisites: SO 113, P 111. An intensive analysis of the nature and development of public opinion with particular consideration of the roles, both actual and potential, of communication and influence. 3 credit hours.

SO 440 Undergraduate Seminar
Prerequisite: consent of department chair. A detailed examination of selected topics in the field of sociolo-

gy and a critical analysis of pertinent theories with emphasis on modern social thought. 3 credit hours.

SO 441 Sociology of Death and Suicide
Prerequisite: SO 113 or consent of instructor. A confrontation with individual mortality and an academic investigation of such phenomena as funerals, terminal illness and crisis intervention, among many others. 3 credit hours.

SO 450 Research Seminar
Prerequisite: P 301 or M 228. The student develops and carries out an original research project in social science, reporting this procedure to the class. 3 credit hours.

SO 451-455 Special Topics in Sociology, Social Services, Anthropology
Prerequisite: SO 113, SO 221, or permission of instructor. Special topics in sociology, anthropology, or social welfare on a variety of current problems and specialized areas not available in the regular curriculum. 3 credit hours.

SO 501-502 Practicum I and II
Prerequisite: consent of department chair. Field experience in sociology or anthropology. Seminars in conjunction with this experience before off-campus field work is undertaken. Contact during the field work experience and guidance by the mentor provide an opportunity for understanding group and individual dynamics and their repercussions. Follow-up seminars and a paper are required. 1-6 credit hours.

SO 599 Independent Study
Prerequisites: consent of instructor and department chair. Opportunity for the student, under the direction of a faculty member, to explore an area of personal interest. This course must be initiated by the student. 1-3 credit hours.

SPANISH

SP 101-102 Elementary Spanish I and II
Stresses pronunciation, aural and reading comprehension, basic conversation and the fundamental principles of grammar. 3 credit hours per term.

SP 201-202 Intermediate Spanish I and II
Prerequisites: SP 101-102 or equivalent. Stresses the reading comprehension of modern prose texts and a review of grammar necessary for this reading. Students are encouraged to read in their own areas of interest. 3 credit hours per term.

SOCIAL WELFARE

SW 220 Introduction to Social Services
Introduction to social services explores two basic questions from a historical perspective: Why are people poor, and, how have societies responded to the conditions of poverty? Focus on how the different economic, political, psychological and sociological arrangements of society and its social institutions create conditions which stimulate and necessitate differing social welfare responses. 3 credit hours.

SW 340 Group Dynamics
Prerequisite: consent of instructor. Designed for students who seek to develop their leadership skills in working with groups of various types. A cognitive and behavioral mastery of a range of complex variables for role effectiveness, including a working knowledge of personal, group and organizational dynamics, professional skills of facilitation and values of one's professional identity. 3 credit hours.

SW 401-402 Field Instruction I and II
Supervised experience relevant to specific aspects of social services in human service agencies, institutions and organizations at the local, state and federal levels. Seminars to assist students with the integration of theoretical knowledge and field techniques through lectures and class presentations. Students are required to spend eight hours a week in the field. 3 credit hours each.

SW 415-416 Methods of Intervention I and II
Basic social work theory in conjunction with practice skills to help students begin to develop professional techniques for intervention at both the macro and micro levels of practice. 3 credit hours each.

SW 599 Independent Study
Prerequisite: consent of the particular faculty member. Designed to permit students to pursue specific areas of interest which may not be available in the curriculum. 1-3 credit hours.

THEATRE ARTS

T 131 Introduction to the Theatre
Play analysis from a literary standpoint and as it relates to special problems of the actor, director, designers and backstage personnel. Practical work in all phases within the classroom. Fall semester. 3 credit hours.

T 132 Theatrical Style
Study of dramatic genres and theatrical conventions through script and critical reading, as well as practical work in class. Spring semester. 3 credit hours.

T 241 Early World Drama and Theatre
Dramatic literature in theatrical contexts from Classical Greece through Restoration England. 3 credit hours.

T 242 Modern World Drama and Theatre
Dramatic literature in theatrical contexts from Realism through the nineteenth century to the present. Includes ethnic drama. 3 credit hours.

T 341 Acting
Developing of acting skills for the stage through games, improvisation and scene study. 3 credit hours.

T 342 Play Directing
Prerequisite: consent of instructor. Fundamentals of directing, staging techniques, working with actors and direction of a one-act play for workshop presentation. 3 credit hours.

T 491-492 Production Practicum I and II
Prerequisite: consent of instructor. Practicum in various areas of theatre: acting, directing, administration, technical theatre and design. Will be directly related to departmental productions. Each 3 credit hours.

T 599 Independent Study
Opportunity for the student under the direction of a faculty member to explore an area of interest. This course must be initiated by the student. 3 credit hours.

TOURISM ADMINISTRATION

TA 165 Introduction to Tourism and Hospitality
An introduction to the tourism and hospitality industry. All major elements of the tourism system will be examined including customer travel patterns, transportation systems, major tourism suppliers and distribution systems and destination marketing organizations. The role of the hospitality industry will be explored in relationship to domestic and international tourism. 3 credit hours.

TA 166 Touristic Geography
An examination of global tourism destination areas; attributes of attractiveness to tourism, travel patterns and changing trends in popular destinations. 3 credit hours.

TA 250 Tourism Dimensions in Contemporary Society
Introduction to the basic concepts of tourism. Tourism is studied from historical, psychological, social, cultural, international, economic and environmental dimensions. Tourism systems, management and impacts are explored. Fundamental change in the tourism industry and future direction is surveyed. 3 credit hours.

TA 322 Marketing for Tourism
Prerequisite: TA 165. An analysis of essential marketing principals as currently applied in the hospitality, tourism and dietetics industries. The hospitality marketing mix will be evaluated in terms of specific applications used in all three industry segments. 3 credit hours.

TA 326 Human Resource Management for Tourism
Prerequisite: TA 165. Provides the knowledge required to formulate and manage effectively the human resources in a hospitality, tourism and dietetics related operation. Manpower analysis, organizational needs, job designs, recruitment

process and other human resource topics are studied. 3 credit hours.

TA 340 Tourism Planning and Policy
Prerequisite: TA 322. Comprehensive review of the tourism planning and policy process used to develop or modify major tourist destination areas. Aspects of the planning and policy process include the goals and objectives; the use of environmental, economical, marketing, topographical, and political studies; and monitoring and control procedures to assure proper planning and policy implementation. Focus on considering both tourism benefits and costs in assessing net impacts. 3 credit hours.

TA 345 Tourism Economics
Prerequisite: EC 133 or permission of instructor. An application of economic principals and research methods to tourist and tourism industry behavior. Practical research methods for assessing economic, social and environmental benefits and costs of tourism development are examined. 3 credit hours.

TA 400 Leadership Theory in Tourism
Prerequisite: TA 326. Situational leadership, quality management models, strategic planning, quality assurance, as well as other classical leadership and management models are applied to the hospitality, food service and tourism industries. 3 credit hours.

TA 401 Leadership Applications in Tourism
Prerequisite: TA 400. Building on the theory presented in TA 400, this course provides the opportunity to apply knowledge of leadership models, concepts and theories through case studies and research projects. A team research project/presentation is the major focus of the course. 3 credit hours.

TA 425 Destination Marketing, Sales and Promotion
Procedures analyzing the tourism resources of a region and guidelines for formulating destination-oriented marketing goals and strategies. Demonstrates how to employ target marketing. Explores developing tourism regional organizations and management systems that enhance the success of a destination. Identifies trends, issues and problems influencing tourism destination marketing. 3 credit hours.

TA 435 Conventions, Meetings and Special Events
Overview of the field of meeting management. Practical experience in fulfilling roles and responsibilities in meeting planning, organizing, directing, controlling and evaluating. 3 credit hours.

TA 490-499 Special Topics
Special studies on a variety of current problems and specialized areas in the field not available in the regular curriculum. 3 credit hours per course.

TA 510 Internship
Prerequisite: completion of 600 hours of practicum and consent of instructor. Interns are required to complete 600 hours field experience in tourism or a related industry. The internship will emphasize supervisory responsibilities whenever possible. This experience will be formulated by faculty, student and industry professional cooperative efforts to help ensure the student's success. The internship will be augmented by selected management readings, written and oral reports, daily journals, and faculty/professional industry management appraisals and conferences. 3 credit hours.

TA 599 Independent Study
Prerequisite: permission of the department coordinator. Independent research projects or other approved phases of independent study. 3 credit hours.

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WNHU Radio Station
W. Vincent Burke, B.S., M.Ed., general manager

UNDERGRADUATE ACADEMIC CALENDAR 2000 – 2002

FALL SEMESTER 2000

August	Tuition and residence charges due	**Tuesday, 1**
	Residence halls open for new students at 10 a.m.	**Saturday, 26**
	Orientation	**Saturday-Tuesday, 26-29**
	Final day of orientation; residence halls open for returning students	**Tuesday, 29**
	Classes begin	**Wednesday, 30**
September	Labor Day–no classes	**Monday, 4**
	Last day to add a day course without a late fee	**Tuesday, 5**
	Last day for schedule revision	**Monday, 11**
October	Last day to petition for January graduation	**Monday, 16**
	Last day to drop a course	**Friday, 13**
November	Residence halls close at 5 p.m.	**Tuesday, 21**
	Thanksgiving Weekend–no classes	**Wednesday-Saturday, 22-25**
December	Classes end	**Monday, 11**
	Reading days	**Tuesday-Wednesday, 12-13**
	Evening exams begin	**Wednesday, 13**
	Day exam period	**Thursday-Tuesday, 14-19**
	Last day of the semester	**Tuesday, 19**
	Residence halls close at 5 p.m.	**Tuesday, 19**
January 2001	Commencement, 2 p.m.	**Saturday, 13**

INTERSESSION 2001

January	Classes begin	**Tuesday, 2**
	Martin Luther King Day–no classes	**Monday, 15**
	Classes end	**Tuesday, 23**

SPRING SEMESTER 2001

January	Tuition and residence charges due	**Tuesday, 2**
	Residence halls open for new students	**Tuesday, 23**
	Orientation	**Wednesday, 24**
	Residence halls open for returning students	**Wednesday, 24**
	Classes begin	**Thursday, 25**
	Last day to add a day course without a late fee	**Monday, 29**
February	Last day for schedule revision	**Friday, 2**
	Presidents' Day–no classes	**Monday, 19**
March	Last day to petition for May graduation	**Thursday, 1**
	Last day to drop a course	**Friday, 9**
	Residence halls close at 5 p.m.	**Friday, 9**
	Spring Recess–no classes	**Monday-Saturday, 12-17**
	Classes resume	**Monday, 19**
April	Holy Thursday and Good Friday–no classes	**Thursday-Friday, 12-13**
May	Classes end	**Monday, 14**
	Reading days	**Tuesday-Wednesday, 15-16**
	Evening exams begin	**Wednesday, 16**
	Day exam period	**Thursday-Tuesday, 17-22**
	Last day of the semester	**Tuesday, 22**
	Residence halls close at 5 p.m.	**Tuesday, 22**
	Commencement, 10 a.m.	**Saturday, 26**

SUMMER SESSIONS 2001

May	First Summer Session classes begin	**Wednesday, 23**
	Memorial Day–no classes	**Monday, 28**
June	Last day to petition for awarding of degrees in August	**Friday, 15**
July	First Summer Session ends	**Tuesday, 3**
	Independence Day–no classes	**Wednesday, 4**
	Second Summer Session classes begin	**Monday, 9**
August	Second Summer Session ends	**Saturday, 18**

FALL SEMESTER 2001

August	Tuition and residence charges due	**Wednesday, 1**
	Residence halls open for new students at 10 a.m.	**Saturday, 25**
	Orientation	**Saturday-Tuesday, 25-28**
	Residence halls open for returning students	**Tuesday, 28**
	Classes begin	**Wednesday, 29**
September	Labor Day–no classes	**Monday, 3**
	Last day to add a day course without a late fee	**Tuesday, 4**
	Last day for schedule revision	**Wednesday, 5**
October	Last day to petition for January graduation	**Monday, 15**
	Last day to drop a course	**Friday, 19**
November	Residence halls close at 5 p.m.	**Tuesday, 20**
	Thanksgiving Weekend—no classes	**Wednesday-Saturday, 21-24**
December	Classes end	**Monday, 10**
	Reading Days	**Tuesday-Wednesday, 11-12**
	Evening exams begin	**Wednesday, 12**
	Day exam period	**Thursday-Tuesday, 13-18**
	Last day of the semester	**Tuesday, 18**
	Residence halls close at 5 p.m.	**Tuesday, 18**

January 2002	Commencement, 2 p.m.	**Saturday, 19**

INTERSESSION 2002

January	Classes begin	**Wednesday, 2**
	Martin Luther King Day–no classes	**Monday, 21**
	Classes end	**Wednesday, 23**

SPRING SEMESTER 2002

January	Tuition and residence charges due	**Wednesday, 2**
	Residence halls open for new students	**Tuesday, 22**
	Orientation	**Wednesday, 23**
	Residence halls open for returning students	**Wednesday, 23**
	Classes begin	**Thursday, 24**
	Last day to add a day course without a late fee	**Monday, 28**
	Last day for schedule revision	**Wednesday, 30**
February	Presidents' Day–no classes	**Monday, 18**
March	Last day to petition for May graduation	**Friday, 1**
	Last day to drop a course	**Friday, 1**
	Residence halls close at 5 p.m.	**Friday, 8**
	Spring Recess–no classes	**Monday-Saturday, 11-16**
	Classes resume	**Monday, 18**
	Holy Thursday and Good Friday–no classes	**Thursday-Friday, 28-29**
May	Classes end	**Monday, 13**
	Reading days	**Tuesday-Wednesday, 14-15**
	Evening exams begin	**Wednesday, 15**
	Day exam period	**Thursday-Tuesday, 16-21**
	Last day of the semester	**Tuesday, 21**
	Residence halls close at 5 p.m.	**Tuesday, 21**
	Commencement, 10 a.m.	**Saturday, 25**

SUMMER SESSIONS 2002

May	First Summer Session classes begin	**Wednesday, 22**
	Memorial Day–no classes	**Monday, 27**
June	Last day to petition for awarding of degrees in August	**Monday, 17**
July	First Summer Session ends	**Wednesday, 3**
	Independence Day–no classes	**Thursday, 4**
	Second Summer Session classes begin	**Monday, 8**
August	Second Summer Session ends	**Saturday, 17**

UNH SOUTHEASTERN

UNDERGRADUATE TRIMESTER CALENDAR

Fall Term 2000	**Monday, Sept. 11 - Friday, Dec. 16**
Last day to petition for January graduation	Monday, Oct. 16
Thanksgiving recess–no classes	Monday, Nov. 20 - Friday, Nov. 24
Winter Term 2001	**Tuesday, Jan. 2 - March 30**
Commencement	Saturday, Jan. 13
Martin Luther King Day–no classes	Monday, Jan. 15
Make-up class for Martin Luther King Day	Friday, Jan. 19
Presidents' Day–no classes	Monday, Feb. 19
Make-up class for Presidents' Day	Friday, Feb. 23
Last day to petition for June graduation	Monday, March 5
Spring Term 2001	**Monday, April 5 - Friday, July 2**
Good Friday–no classes	Friday, April 13
Commencement	Saturday, May 26
Memorial Day–no classes	Monday, May 28
Make-up class for Memorial Day	Friday, June 1
Last day to petition for awarding of degrees in August	Friday, June 15
Summer Term 2001	**Monday, July 9 - Friday, Aug. 17**
Fall Term 2001	**Monday, Sept. 10 - Friday, Dec. 14**
Last day to petition for January graduation	Monday, Oct. 15
Thanksgiving recess–no classes Friday, Nov. 23	Monday, Nov. 19 -
Winter Term 2002	**Wednesday, Jan. 2 - Friday, March 29**
Commencement	TBA
Martin Luther King Day–no classes	Monday, Jan. 21

Make-up class for Martin Luther King Day	Friday, Jan. 25
Presidents' Day–no classes	Monday, Feb. 18
Make-up class for Presidents' Day	Friday, Feb. 22
Last day to petition for May graduation	Friday, March 1

Spring Term 2002	**Monday, April 1 - Friday, June 28**
Good Friday–no classes	Friday, March 29
Commencement	TBA
Memorial Day–no classes	Monday, May 27
Make-up class for Memorial Day	Friday, May 31
Last day to petition for awarding of degrees in August	Friday, June 14

Summer Term 2002	**Monday, July 8 - Friday, Aug. 16**

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CAMPUS MAP KEY

1 Harugari Hall—School of Hospitality & Tourism
2 South Campus Hall—School of Public Safety & Professional Studies/Registrar/Graduate Services
3 1124 Campbell Avenue—Orchestra New England
4 Kaplan Hall—Graduate School/Graduate Admissions
5 Dodds Hall—Classroom Building/University Theatre
6 Bethel Hall—School of Business/ELS Center
7 Gate House
8 Campus Store/University Police
9 Student Center
10 Buckman Hall—School of Engineering & Applied Science
11 M.K. Peterson Library
12 Maxcy Hall—Administration/College of Arts & Sciences
13 Bayer Hall—Admissions & Financial Aid
14 Maintenance Shop
15 Psychology Building
16 Dunham Hall
17 Sheffield Hall
18 Winchester Hall
19 Arbelter Maenner Chor
20 446 Orange Avenue
21 Echlin Hall—EMBA/Computer Center
22 Charger Gymnasium
23 Dental Hygiene Clinic
24 Norman I. Botwinik Hall
25 Roland M. Bixler Hall

University of New Haven

Admissions Office
300 Orange Avenue
West Haven, CT 06516

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